

Coordinating Public Transport

VICTORIA

Victorian
Auditor-General

Coordinating Public Transport

Ordered to be printed

VICTORIAN
GOVERNMENT PRINTER
August 2014

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ISBN 978 1 922044 92 1

The Hon. Bruce Atkinson MLC
President
Legislative Council
Parliament House
Melbourne

The Hon. Christine Fyffe MP
Speaker
Legislative Assembly
Parliament House
Melbourne

Dear Presiding Officers

Under the provisions of section 16AB of the *Audit Act 1994*, I transmit my report on the audit *Coordinating Public Transport*.

The audit assessed the effectiveness of Public Transport Victoria (PTV) in achieving seamless travel within and between different transport modes. It examined whether institutional arrangements support effective strategic planning for, and governance of, coordination initiatives, and whether key strategies and initiatives for managing coordination have been effective.

I found that public transport services are poorly coordinated and progress to improve this has been slow. This longstanding deficiency is due to past management approaches that have given insufficient attention to driving coordination. This has begun to change with the establishment of PTV and its explicit focus on coordination. However, further work is required to address existing barriers to coordination and to finalise plans for improving the coordination of public transport services.

I have made a series of recommendations aimed at addressing these issues. I am encouraged by the commitment of PTV and the Department of Transport, Planning and Local Infrastructure to implementing actions against these recommendations.

Yours faithfully



John Doyle
Auditor-General

6 August 2014

Contents

Auditor-General's comments	vii
Audit summary	ix
Background.....	ix
Conclusions	x
Findings	xi
Recommendations	xiv
Submissions and comments received	xiv
1. Background.....	1
1.1 Introduction	1
1.2 Recent reviews of public transport performance	5
1.3 Legislative transport system objectives.....	6
1.4 Institutional arrangements and responsibilities	8
1.5 Audit objectives and scope	9
1.6 Audit method and cost	9
1.7 Structure of the report	9
2. Planning and governance of coordination initiatives.....	11
2.1 Introduction	12
2.2 Conclusion	12
2.3 Focus of public transport coordination in statewide strategic planning	13
2.4 Public transport planning to achieve coordination.....	16
2.5 Statewide governance arrangements for coordination initiatives	18
3. Addressing the barriers to coordination.....	21
3.1 Introduction	22
3.2 Conclusion	22
3.3 The need for better public transport coordination	22
3.4 Barriers to effective and efficient coordination	23
4. Monitoring and evaluating the performance of coordination initiatives	41
4.1 Introduction	42
4.2 Conclusion	42
4.3 Monitoring and evaluating the performance of public transport coordination initiatives	42

Appendix A. Maps of Victoria's public transport.....	51
Appendix B. Scheduled weekday bus and train service connections.....	55
Appendix C. <i>Audit Act 1994</i> section 16—submissions and comments.....	59

Auditor-General's comments



John Doyle
Auditor-General

Well-coordinated public transport services are essential for supporting mobility and efficient access to critical services, such as education and employment.

Key objectives within the *Transport Integration Act 2010* (the Act) establish a strong imperative for achieving a coordinated public transport system. Public Transport Victoria (PTV) was created in December 2011 with a particular focus on increasing the share of public transport trips, expanding the network and ensuring public transport services are properly coordinated.

Under the Act, the Department of Transport, Planning and Local Infrastructure (DTPLI) is responsible for leading strategic policy, planning and improvements relating to the transport system.

In this audit I examined how well PTV is managing the coordination of trams, trains and buses, and specifically how its activities and existing contractual arrangements support the achievement of seamless travel within and between different modes. I also examined DTPLI's role in strategic planning.

My audit found that public transport services are poorly coordinated, and progress to improve this has been slow. The longstanding deficiencies I identified in the planning and management of coordination initiatives are particularly concerning. These shortcomings have been identified in previous audits of public transport undertaken by my office. For example, the 2012 audit *Public Transport Performance* found that the former Department of Transport had not adequately measured and managed coordination, as it had yet to finalise service plans for trams, buses and regional trains, including for their coordination. My 2013 report *Developing Transport Infrastructure and Services for Population Growth Areas* similarly noted the need for PTV to complete these plans.

PTV's establishment, including its focus on improving coordination, is a key development that has begun to address this situation. However, significant challenges remain, including gaps in the frequency, availability and directness of bus services, the poor location and design of many bus–train interchanges, and the inadequate provision of customer information. There are also no contractual incentives for operators to work together to improve the coordination of their services. These deficiencies compromise the state's capacity to achieve effective coordination across the wider network and represent significant ongoing barriers.

Additionally, the absence of statewide coordination objectives and governance arrangements limits DTPLI's ability to effectively oversee and coordinate related initiatives across the portfolio.

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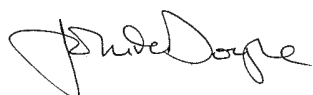
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I have made nine recommendations for addressing these issues, which pleasingly DTPLI and PTV have accepted. These recommendations reinforce the need for PTV to accelerate efforts to finalise plans for metropolitan trams and buses and regional transport services, and to develop measures that reliably convey the level of coordination across different public transport modes. They also address the need for DTPLI to develop statewide performance measures and governance arrangements to monitor achievement of transport coordination outcomes.

I look forward to reviewing their progress in implementing the recommendations.

Finally, I would like to thank the staff of DTPLI and PTV for their assistance and cooperation during this audit.

A handwritten signature in black ink, appearing to read 'John Doyle', with a stylized, cursive script.

John Doyle
Auditor-General
August 2014

Audit summary

Background

Melbourne's radial train network offers services across large parts of the city. However, while around 85 per cent of people live near a bus, only 30 per cent of dwellings are within walking distance of the train network.

Key objectives within the *Transport Integration Act 2010* (the Act) establish a strong imperative for achieving a coordinated public transport system. Specifically, these include that the transport system should facilitate network-wide efficient, coordinated and reliable movement of persons and goods, as well as seamless travel within and between different modes of transport. Effective coordination between public transport modes is essential for enabling the efficient movement of persons, including access to jobs and services.

The efficiency, simplicity and quality of connections between public transport modes can make a major difference to people's willingness to use public transport. It serves to minimise the time for connecting between different modes and, where feasible, promote a 'turn up and go' mentality where passengers need not look at timetables before they travel.

Institutional arrangements and responsibilities

Public Transport Victoria (PTV) was created in December 2011 with the aim of improving public transport—with a particular focus on increasing the share of public transport trips, expanding the network and ensuring public transport services are properly coordinated. Through seeking to achieve these goals, PTV can also play a critical role in managing traffic congestion by reducing car dependency and the associated demand on road space and car parking at train stations.

PTV oversees public transport operators who are responsible for the day-to-day operation of services under the existing franchise arrangements and, subject to PTV's specifications, for improving scheduling to support better connectivity between modes.

Under the Act, the Department of Transport, Planning and Local Infrastructure (DTPLI) is responsible for leading strategic policy, planning and improvements relating to the transport system. It therefore has a key role to play in supporting and leading related initiatives to improve public transport coordination.

Previous performance audits

Over the past five years VAGO has tabled three reports on audits that have considered the performance of public transport. These have consistently identified challenges in addressing demand for services and the need to improve performance monitoring of the public transport system and of the adequacy of coordination.

Objectives of this audit

This audit assessed PTV's progress and effectiveness in coordinating public transport services. It examined whether institutional arrangements support effective strategic planning for and governance of coordination initiatives, and whether key strategies and initiatives for managing coordination have been effective.

Conclusions

Public transport services are poorly coordinated. Progress on improving public transport coordination has been slow, despite related initiatives featuring prominently in statewide strategic land use and transport plans over the past decade. Over this time, public transport has been managed as a collection of separate modes rather than as an integrated system because institutional deficiencies have not supported effective planning for, and governance of, coordination initiatives.

Consequently, these past approaches have not given sufficient attention to driving improvements in coordination—many bus services remain indirect, are infrequent and have long wait times for connecting train services.

PTV's establishment and explicit focus on improving public transport services and coordination is a key development. By shifting its focus from modal to network planning, PTV has improved its understanding of the challenges and actions needed to improve coordination.

PTV's draft coordination framework is a good basis for public transport planning and action. However, there is more to do to achieve adequate coordination within and between different modes, including:

- finalising its draft coordination framework—including plans for buses, trams and rural and regional public transport services to clarify the role of each mode in contributing to statewide coordination objectives
- developing measures, and reporting on indicators that reliably convey the level of intended and actual coordination across different public transport modes
- strengthening its monitoring processes around the measurement of on-time running of train and bus coordination
- better incorporating performance incentives within franchise agreements to achieve coordination improvements.

There is also a need for DTPLI to develop clearly defined statewide coordination objectives, performance measures, and governance arrangements to monitor achievement of coordination outcomes.

Ongoing delays in addressing existing barriers to coordination will impede the achievement of related transport system objectives.

Findings

Planning and governance of coordination initiatives

The absence of clearly defined agency performance measures for transport system coordination compromises DTPLI's capacity to effectively oversee and coordinate related initiatives across the portfolio.

Public transport planning to achieve coordination

PTV's strategic planning processes involve the preparation of network development plans for train, tram, bus and regional transport services. At present, only the December 2012 *Network Development Plan—Metropolitan Rail* is completed.

While this is positive and provides a sound basis for PTV's future planning of the train network, this work has been progressing slowly. Further work is still required to finalise the bus, tram and regional services plan.

Completing this work will be vital to further define and achieve desired coordination outcomes across the network, and until they are finalised their implications for future coordination initiatives cannot be assessed.

PTV has also developed a draft Multi-Modal Coordination Policy and Strategy that supports the consistent and integrated development of network development plans.

This initiative represents a major step forward from the previous mode-by-mode-based planning approach. Importantly, unlike previous plans it establishes a definition of coordination based on the relative costs and benefits of delivering different levels of coordination. However, this strategy has existed as a draft since August 2011, and therefore it will be important for PTV to finalise it and extend its scope to regional services.

Statewide governance arrangements for coordination initiatives

DTPLI has established arrangements designed to support effective cross-government implementation of transport system initiatives, including coordination. However, it is not evident that these arrangements are effective as they do not currently involve monitoring progress against the Act's objectives relating to coordination.

PTV oversees public transport operators—train, tram and bus—who are responsible for the day-to-day operation of services under the existing franchise arrangements. These agreements, valued at around \$2.7 billion per annum, do not include explicit provisions focused on achieving defined system-wide coordination objectives. The absence of such provisions means that PTV largely relies on the goodwill of operators and indirect incentives within current franchise agreements to achieve coordination improvements.

Optimising network planning and scheduling

PTV does not have adequate systems to efficiently and effectively support its planning to integrate the public transport network. PTV acknowledges that this situation has led to increased costs and lost opportunities for improving services and has procured a network planning and scheduling system which is scheduled to be deployed in November 2014. The proposed new system aims to deliver better coordination between services, opportunities for additional coordinated services and improved operational performance.

Addressing the barriers to coordination

Past deficiencies in statewide planning for public transport coordination have resulted in a number of tram routes that terminate short of the nearest train station, and many bus routes that do not harmonise well with the rail network.

While 61 per cent of buses serving key stations across Melbourne's 15 train lines connect with a train service, only 21 per cent of all train arrivals at these stations connect with the less frequent bus services. For some people—particularly those living in growth areas without a car—this lack of connecting services can reduce the number of accessible work, education and other opportunities.

Improving coordination across the wider network remains a significant challenge for PTV given:

- existing levels of disharmonisation of service frequencies across modes—information supplied by PTV indicates that around 45 per cent of Melbourne's bus routes run a weekday timetable that does not harmonise with trains
- longstanding gaps in the frequency, availability and directness of regional and metropolitan bus services that compromise the state's capacity to achieve effective coordination across the wider network
- poor interchange design, with much of the infrastructure, location and design of interchanges unsuitable for passenger needs
- inadequate customer information, with signage at many rail and bus stations not properly designed to convey effective information to travellers to support their timely connection with other services.

Until these deficiencies are addressed, future improvements to the coordination of public transport will be limited.

Monitoring and evaluating the performance of coordination initiatives

PTV's current indicator of bus–train connectivity across the network is limited and inaccurate. For instance:

- It is restricted to metropolitan Melbourne and does not consider regional modal connections nor connections with trams.
- It only reflects the performance of a limited number of stations across the network—38 per cent. If all bus–train connections are measured, only 53.6 per cent of scheduled connections have a waiting time of less than 10 minutes.
- It does not reflect the true level of connectivity across the network, as it focuses on the number of lower frequency bus services that connect with higher frequency trains, and ignores the much greater number of train arrivals that have no connecting bus service.

Limitations in monitoring rail and bus operators

PTV's capacity to effectively monitor the performance of bus operators in improving coordination is compromised by an over-reliance on self-reporting, minimal quality assurance, and by a lack of reporting on the achievement of defined coordination goals.

While PTV has limited monitoring arrangements that provide it with insights into whether bus services run, in most cases these are not sufficient to assess whether they run on time.

Recent initiatives to improve bus tracking systems have failed to meet their original objectives. In September 2013, having spent \$14.3 million to implement a new system across 95 per cent of the metropolitan bus network, PTV activated it on only 30 per cent of the network and discontinued the remaining rollout.

PTV advised that this decision was based on its review of bus tracking systems across Australia and internationally, which led to its decision to procure new more innovative technology that provided better value for money.

Information supplied by PTV during the audit indicates that the new system is a more cost-effective solution. However, PTV has not adequately documented this assessment and decision. PTV expects the new system to be fully operational across the metropolitan bus network by July 2014 and following this, rolled out progressively across regional buses.

Recommendations

Number	Recommendation	Page
That Public Transport Victoria:		
1.	expedites efforts to finalise its Multi-Modal Coordination Policy and Strategy and plans for buses, trams and rural and regional services	20
2.	develops incentives in future bus contracts focused on achieving defined system-wide coordination objectives.	20
That the Department of Transport, Planning and Local Infrastructure:		
3.	develops, in consultation with transport agencies, statewide and agency performance measures for transport system coordination to support the planning and monitoring of public transport coordination initiatives	20
4.	reviews its governance arrangements and establishes mechanisms for systematically monitoring the progress and outcomes of statewide coordination initiatives.	20
That Public Transport Victoria:		
5.	requires the operators of all new bus contracts to undertake a full timetable rebuild to support achievement of defined system-wide coordination targets	39
6.	collects and analyses data on the directness of bus routes to assist in service planning	39
7.	provides real-time bus service information to public transport users to better support the connectivity of buses with other public transport modes	39
8.	<ul style="list-style-type: none"> develops measures and reports on indicators that reliably convey the level of intended and actual coordination across different public transport modes strengthens its monitoring processes around the measurement of on-time running of trains and buses and coordination outcomes. 	49
That the Department of Transport, Planning and Local Infrastructure:		
9.	ensures its proposed performance monitoring and reporting framework evaluates achievement of defined statewide coordination goals.	49

Submissions and comments received

In addition to progressive engagement during the course of the audit, in accordance with section 16(3) of the *Audit Act 1994* a copy of this report, or part of this report, was provided to Public Transport Victoria and the Department of Transport, Planning and Local Infrastructure with a request for submissions or comments.

Agency views have been considered in reaching our audit conclusions and are represented to the extent relevant and warranted in preparing this report. Their full section 16(3) submissions and comments are included in Appendix C.

1 Background

1.1 Introduction

1.1.1 Victoria's public transport network

Victoria's public transport network consists of train, tram, bus and coach services. The network has the dual roles of providing efficient mass transit, primarily for people commuting to work or education, while also delivering social transit so that all Victorians have a means of travelling to where they want to go.

The following modes of travel contribute to these roles:

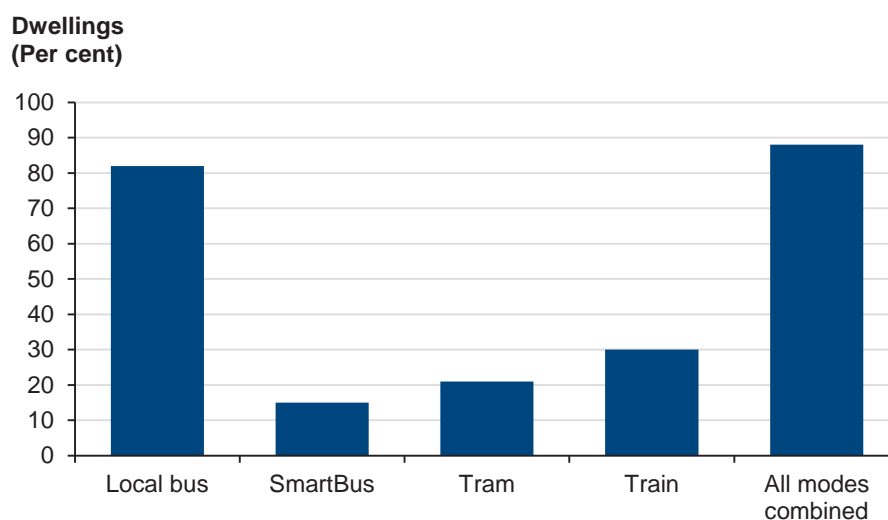
- **Metropolitan and regional trains**—are the backbone of the mass transit system and the primary mode for fast, efficient access to central Melbourne from the middle and outer suburbs, and regional Victoria. Metropolitan trains carry the greatest number of passengers, with in excess of 225 million boardings in 2012–13.
- **Trams or light rail**—provide a high capacity commuting option for shorter trips, up to 10 kilometres to and from the central business district (CBD), and play an important role in linking with other modes of transport.
- **SmartBuses**—are premium cross-town bus services linking radial train lines and key activity areas in Melbourne's middle and outer suburbs through orbital, cross-town routes.
- **Local metropolitan and regional buses**—extend the reach of public transport close to where people live, connecting people to rail routes and providing a basic connection for low demand areas.
- **Regional coaches**—provide a long-distance public transport option where rail is not viable, and for connecting to rail routes.

Appendix A contains a number of maps of Victoria's public transport system.

1.1.2 Importance of coordination

Melbourne's radial train network offers services across large parts of the city. However, Figure 1A shows that while around 85 per cent of people live near a bus, only 30 per cent of dwellings are within walking distance of the train network. This means that effective coordination between public transport modes is essential to enable the efficient movement of persons, including access to jobs and services.

Figure 1A
Melbourne dwellings within 400 metres of a public transport stop, 2010



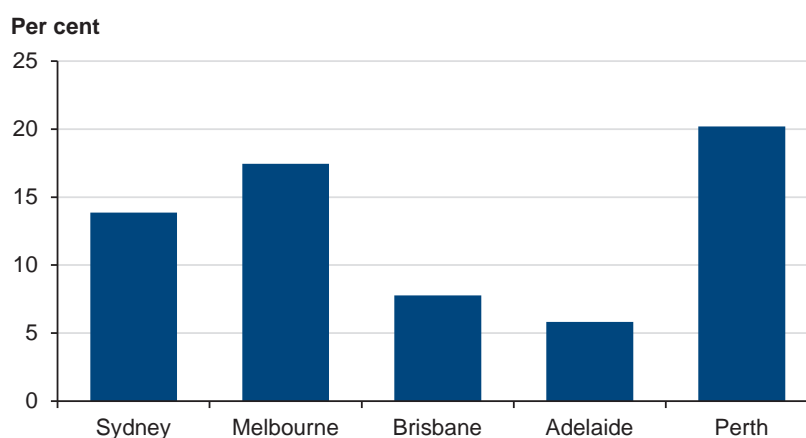
Source: Victorian Auditor-General's Office from Public Transport Victoria's, *Network Development Plan—Metropolitan Rail*, December 2012.

1.1.3 Incidence of multi-modal journeys

A significant number of Melbourne's public transport users undertake multi-modal trips. Data supplied by Public Transport Victoria (PTV) indicates that in 2011, 30 per cent of train trips, 34 per cent of tram trips and 45 per cent of all bus trips in Melbourne involved transfers to other public transport modes.

Figure 1B illustrates that according to Australian Bureau of Statistics data, Melbourne has the second highest proportion of public transport multi-modal commuter trips across Australia's five largest cities.

Figure 1B
Proportion of public transport journeys to work that involved multiple public transport modes, 2011



Source: Victorian Auditor-General's Office from the Australian Bureau of Statistics, *Census of Population and Housing*, 2011.

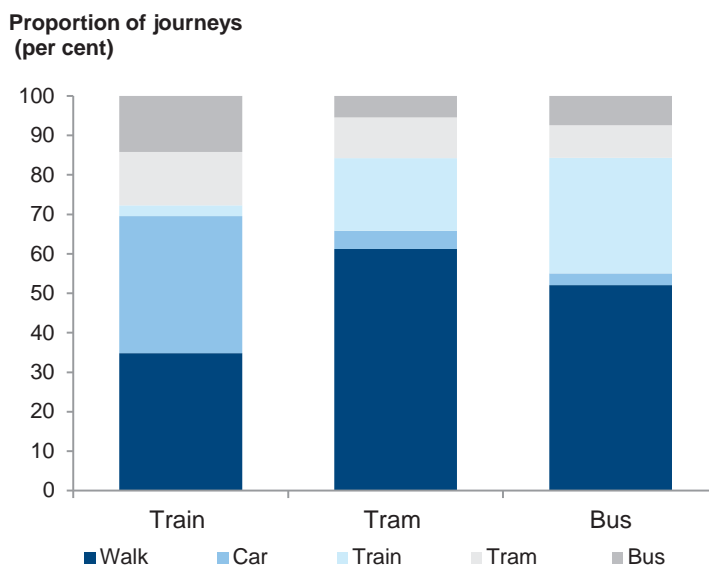
However, it is important to note that a number of factors can influence the nature and extent of multi-modal public transport journeys undertaken in each city. For instance:

- Commuters from the middle and outer suburbs are more likely to require a rapid transit component to their commute—for example, train—to ensure satisfactory travel times.
- Cities with buses that provide a direct mass-transit transport option to the CBD, primarily Brisbane and Adelaide, are likely to have less demand for multi-modal journeys as these buses provide both the local pick up and the rapid transit component of the journey.
- Cities with more extensive train networks are similarly less likely to generate demand for multi-modal journeys because a greater share of the population is likely to be within walking distance of a train station and therefore not require a feeder service—for example, a connecting bus trip.
- Multi-modal trips will be more commonplace in cities where transfers between modes are a fundamental part of the network design. For example, very few middle and outer suburban bus routes in some larger cities, such as Melbourne and Perth, service the CBD and instead run to train stations where passengers generally connect with trains to access inner city areas.

Nature of multi-modal transfers

Figure 1C shows that tram and bus services in Melbourne are predominately accessed by walking—61 per cent for trams and 52 per cent for buses. Train journeys are heavily reliant on access by private cars, which account for around 35 per cent of connecting passenger journeys. However, buses play a substantial feeder role for train services, with 14 per cent of all train journeys involving the use of a bus.

Figure 1C
Weekday public transport inter-modal transfers, 2011



Source: Victorian Auditor-General's Office based on data provided by Public Transport Victoria.

1.1.4 Attributes of effective coordination

The success of public transport coordination typically depends on a range of characteristics, including:

- **Network integration**—bus and rail systems should complement one another. Feeder services using buses, trams or light rail should be designed to maximise the patronage of the train lines.
- **Physical integration**—the close proximity and ease of access to public transport, including interchanges, will greatly enhance the likelihood of use. Interchanges should be carefully designed to allow passengers to efficiently change modes. Ideally passengers should be within a short walking distance from their residences to a transit stop.
- **Information integration**—a comprehensive, easy-to-use passenger travel map is critical to successful multi-modal travel. The signage at rail and bus stations should be properly designed to convey effective information to travellers about travel options.

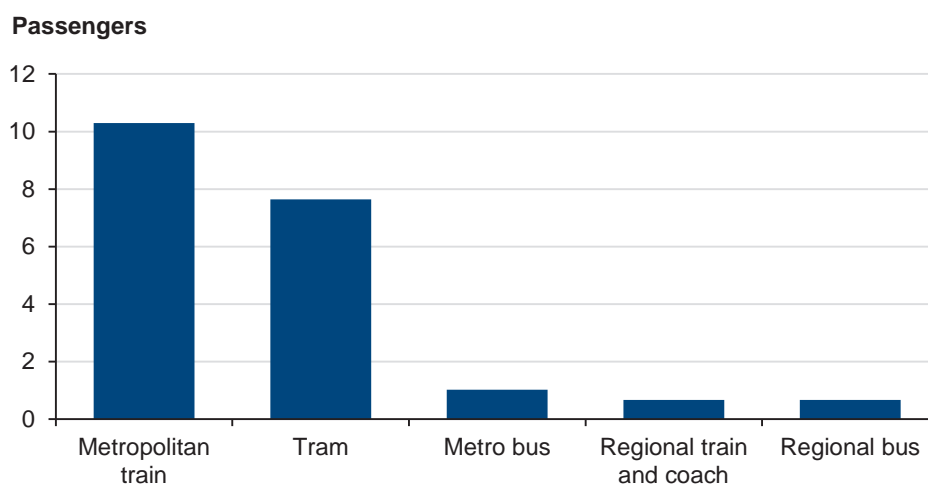
Frequent, direct and harmonised transport services are vital to achieving effective network integration. They serve to minimise the time for connecting between different modes and where feasible promote a 'turn up and go' mentality where passengers need not look at timetables before they travel. This can make a major difference to people's willingness to use public transport and thus potentially reduce their car dependency, helping to improve congestion on roads and lower greenhouse gases and other emissions.

Figure 1D shows that while around 85 per cent of residents live near a bus, patronage per kilometre is comparatively much lower than other modes, with only around one passenger per kilometre. This highlights a significant opportunity to leverage better value from existing bus services.

Research by PTV indicates that this is due to low satisfaction with these services mainly because of meandering routes, infrequent services, and insufficient hours of operation, which reduce their attractiveness to potential users. This situation impedes the achievement of mode shift, and exacerbates traffic congestion and pressure on limited train station car parking.

For example, a 2008 review of car parking use at metropolitan train stations by the former Department of Transport revealed that the total number of parked cars at all metropolitan stations typically exceeded the number of available parking spaces by around 50 per cent, with overflow consequently occurring in local residential streets.

Figure 1D
Passengers per kilometre by mode, 2012–13



Source: Victoria Auditor-General's Office based on data provided by Public Transport Victoria.

1.2 Recent reviews of public transport performance

1.2.1 Previous performance audits

Over the past five years VAGO has tabled three audit reports that have considered the performance of public transport:

- *Melbourne's New Bus Contracts*—June 2009
- *Public Transport Performance*—February 2012
- *Developing Transport Infrastructure and Services for Population Growth Areas*—August 2013.

These reviews have consistently identified challenges in addressing demand for services and the need to improve performance monitoring of the public transport system and of the adequacy of coordination.

Specifically, our 2012 audit *Public Transport Performance* found that the former Department of Transport had not adequately measured and managed coordination, as it had yet to finalise service plans for trams, buses and regional trains, including for their coordination.

Our 2013 report *Developing Transport Infrastructure and Services for Population Growth Areas* similarly noted the need for PTV to complete these plans and develop minimum service standards to guide its planning for the frequency and directness of public transport services. The report found a significant backlog of required public transport infrastructure in growth areas. It also found that these areas had fewer, less frequent and less direct public transport services compared to the rest of Melbourne.

The 2009 audit *Melbourne's New Bus Contracts* found the operational performance regime for bus services needed to be strengthened to provide greater assurance about the on-time running of buses. It noted that the former Department of Transport could not be assured that the 5 per cent random sample used to measure performance provided a fair representation of actual performance of the entire bus network. It recommended that the department strengthen the process by verifying that the operators' approaches were adequate and periodically inspecting their operational records.

1.2.2 Parliamentary inquiries

The Outer Suburban/Interface Services and Development Committee's December 2012 *Inquiry into Liveability Options in Outer Suburban Melbourne* identified a number of shortcomings with public transport services to outer suburbs. It found that inadequate public transport network planning, particularly for bus services in growth areas, has meant that service quality—directness of routes, service frequencies and connectivity to other modes—has lagged behind the rest of Melbourne.

The committee recommended that the government establish guidelines for multi-modal transport planning in order to promote improved connectivity between transport modes.

The May 2010 report of the Select Committee of the Legislative Council on Train Services found the need for greater coordination of the metropolitan train timetable with bus timetables to ensure timely and efficient connectivity.

1.3 Legislative transport system objectives

The *Transport Integration Act 2010* (the Act) outlines a vision for an integrated and sustainable transport system that contributes to an inclusive, prosperous and environmentally responsible state. Figure 1E summarises the state's objectives and decision-making principles for the public transport system.

Figure 1E
Transport Integration Act 2010—objectives and principles

<p>Objectives—the transport system should:</p> <ul style="list-style-type: none"> • promote social and economic inclusion—minimise the barriers to access so that the transport system is available to as many people as possible and provide tailored infrastructure, services and support to those who find it difficult to use transport • facilitate economic prosperity—enable efficient and effective access for persons and goods to places of employment, markets and services, and reduce the costs and improve the reliability of transport • actively contribute to environmental sustainability—protect and offset harm to the natural, local and global environment, promote less harmful forms of transport and improve the environmental performance and energy efficiency of all transport modes • provide for the effective integration of transport and land use—better connect the transport system and land use to improve accessibility with a focus on reducing the need for private motor vehicle transport and the extent of travel • facilitate efficient, coordinated and reliable movement—balance efficiency across the network to optimise capacity, maximise use of existing infrastructure, facilitate integrated and seamless travel within and between different modes, and provide predictable and reliable services • be safe and support health and wellbeing—work to create a system where people are safe from the impacts of system failure and improper behaviour, and which promotes forms of transport that have the least negative impact on health and wellbeing. <p>Decision-making principles—agencies should have regard to the following principles:</p> <ul style="list-style-type: none"> • integrated decision-making—achieving objectives through coordination across government agencies and with the private sector • triple bottom line assessment—taking into account all the economic, social and environmental impacts of decisions and assessing their value for money • equity—achieving equity between persons irrespective of personal attributes or location • transport system user perspective—understanding what transport users need and improving the system in ways that address these needs • precautionary principle—acting to address serious environmental threats • stakeholder engagement and community participation—taking into account the interests of transport system users and members of local communities through appropriate engagement • transparency—providing reliable and relevant information in forms that help the community understand transport issues and the basis for government decisions.

Source: Victorian Auditor-General's Office from the *Transport Integration Act 2010*.

The objective of facilitating network-wide efficient, coordinated and reliable movement of persons and goods is particularly relevant to the coordination of public transport.

1.4 Institutional arrangements and responsibilities

1.4.1 Public Transport Victoria

PTV was created in December 2011 with the aim of improving public transport—with a particular focus on increasing the share of public transport trips, expanding the network and ensuring public transport services are properly coordinated. Through seeking to achieve these goals, PTV can also play a critical role in managing traffic congestion by reducing car dependency and the associated demand on road space.

PTV oversees public transport operators who are responsible for the day-to-day operation of services under the existing franchise arrangements and, subject to PTV's specifications, for improving scheduling to support better connectivity between modes.

In December 2012, PTV released its *Network Development Plan—Metropolitan Rail*. This was the first step in defining the future needs for public transport and in redesigning train services to maximise opportunities for seamless coordination with buses and trams.

PTV is currently updating its other network plans for trams, buses and regional services with the aim of improving performance and coordination in line with the transport objectives set out in the Act.

It is also developing a Multi-Modal Coordination Policy and Strategy and implementing initiatives to improve scheduling and timetabling to further support improved connectivity between modes. A key focus of this work has been on improving bus–train and tram–train connections in metropolitan Melbourne.

1.4.2 Department of Transport, Planning and Local Infrastructure

Under the Act, the Department of Transport, Planning and Local Infrastructure (DTPLI) is responsible for leading strategic policy, planning and improvements relating to the transport system. It is required to collaborate with other agencies to ensure that policies and plans for an integrated and sustainable transport system are developed, aligned and implemented.

In May 2014, DTPLI released the state's metropolitan planning strategy—*Plan Melbourne*—which outlines a vision for Melbourne's growth and the related infrastructure and services needed. The strategy emphasises the need for a more connected Melbourne, including initiatives to harmonise public transport services across trains, trams and buses to provide better access to job-rich areas in the suburbs.

1.5 Audit objectives and scope

The objective of the audit was to assess PTV's progress and effectiveness in coordinating public transport services by assessing whether:

- institutional arrangements support effective strategic planning for, and governance of, coordination initiatives
- key strategies and initiatives for managing coordination have been effective.

The audit focused on how well PTV is managing the coordination of trams, trains and buses, and specifically on how its activities and existing contractual arrangements support the achievement of seamless travel within and between different modes. The audit also examined DTPLI's related role in strategic planning.

1.6 Audit method and cost

The audit was conducted in accordance with the Australian Auditing and Assurance Standards. Pursuant to section 30(3) of the *Audit Act 1994*, unless otherwise indicated any person named in this report is not the subject of adverse comment or opinion.

The cost of the audit was \$390 000.

1.7 Structure of the report

The report has three further parts:

- Part 2 examines whether planning and governance arrangements adequately support coordination initiatives
 - Part 3 examines whether planned strategies and initiatives adequately address the barriers to effective and efficient coordination
 - Part 4 examines the adequacy of arrangements for monitoring, evaluating and reporting on public transport coordination outcomes.
-

2 Planning and governance of coordination initiatives

At a glance

Background

Effective strategic planning for public transport coordination is vital to guide future development of the public transport system and to achieve the transport system objectives of efficiency, coordination and reliability.

Conclusion

Public transport has historically been managed as a collection of separate modes of travel rather than as an integrated system. This has resulted in inadequate coordination between modes, and long wait times between connecting train and bus services.

This has begun to change with the establishment of Public Transport Victoria (PTV) and its explicit focus on coordination. However, further work is required to develop and finalise its plans for key services and to improve their coordination.

Findings

- Despite past state policies and initiatives, the coordination of public transport services remains inadequate and slow.
- Until PTV finalises its bus, tram, regional services and multi-modal plans, its effectiveness in improving the coordination of public transport cannot be fully assessed.
- The absence of clearly defined statewide and agency performance measures for transport system coordination compromises the Department of Transport, Planning and Local Infrastructure's (DTPLI) capacity to effectively oversee and coordinate related initiatives across the portfolio.
- Franchise agreements do not currently include explicit provisions focused on achieving defined system-wide coordination objectives.

Recommendations

- That PTV expedites efforts to finalise its Multi-Modal Coordination Policy and Strategy, including plans for buses, trams and rural and regional services.
- That DTPLI develops statewide performance measures and governance arrangements to monitor achievement of transport coordination outcomes.

2.1 Introduction

Effective strategic planning for public transport coordination is vital to guide future development of the public transport system, and to achieve the transport system objectives of efficiency, coordination and reliability.

Such planning provides clear direction to agencies for focused action through:

- explicit statewide objectives, strategies and priorities for coordinating public transport
- clearly defined agency responsibilities and accountabilities.

Sound governance arrangements reinforce accountabilities and provide assurance about effective implementation of public transport coordination initiatives across agencies and operators.

This Part of the report examines whether:

- strategic planning for managing coordination is soundly based, integrated and aligned
- governance arrangements support coordinated and effective implementation of initiatives by transport agencies and operators.

2.2 Conclusion

Historically, public transport has been managed as a collection of separate modes of travel rather than as an integrated system. This has resulted in inadequate coordination between modes, and long wait times between connecting train and bus services.

Specifically, there was a lack of explicit focus on coordination within past modal plans including a lack of clearly defined coordination objectives and clarity over the role of different modes in contributing to desired statewide outcomes. Similarly, governance arrangements have not adequately supported coordination, as they have focused mainly on managing individual modes and contracts with related providers, rather than managing the network as an integrated system or establishing the contractual provisions necessary for improving coordination.

This has begun to change with the establishment of Public Transport Victoria (PTV) and its explicit focus on coordinating public transport. There is now a greater focus on improving coordination, including clarity on the roles of various modes in contributing to related initiatives. This has been achieved by adopting a network—rather than modal only—approach to public transport planning.

Despite this, further work is required to develop and finalise plans for metropolitan trams and buses and regional transport services.

2.3 Focus of public transport coordination in statewide strategic planning

Initiatives to improve public transport coordination have featured prominently in statewide strategic land use and transport plans developed since 2002. These are summarised in Figure 2A.

Figure 2A
Strategic planning for improving public transport coordination

Policy document	Key objectives, actions and strategies for coordinating public transport
<i>Melbourne 2030—Planning for sustainable growth</i> (2002)	Key goal was to increase public transport's share of motorised trips within Melbourne to 20 per cent by 2020. It proposed a number of enhancements to public transport including improving coordination between services and interchanges.
<i>Linking Melbourne—Metropolitan Transport Plan</i> (2004)	Aimed to make the public transport system more user-friendly by integrating timetables, presenting uniform information, improving ticketing and upgrading interchanges.
<i>Meeting Our Transport Challenges—Connecting Victorian Communities</i> (2006)	Aimed to improve connections between different transport modes and make cross-town travel by public transport a more attractive and viable alternative to the car. Key initiatives focused on improving metropolitan interchanges and synchronising train, tram and bus timetables.
<i>Victorian Transport Plan</i> (2008)	Continued the focus on integrating timetables and making trams, trains and buses more accessible by improving modal connections.
<i>Network Development Plan—Metropolitan Rail</i> (2012)	A key aim is to redesign train services to maximise opportunities for seamless coordination with buses and trams.

Source: Victorian Auditor-General's Office.

Despite these past state policies and initiatives, the coordination of public transport services remains inadequate. This is because, historically, the state has managed public transport services as a collection of separate modes of travel rather than as an integrated system. This, together with the absence of defined coordination objectives including clarity over the role of different modes in contributing to desired statewide outcomes, has been a major barrier to achieving real progress.

The existing train and tram network is made up of a number of lines whose timetables were not initially developed in conjunction with routes they connect with.

Additionally, many of Melbourne's bus routes currently have long wait times, indirect routes and do not operate on schedules designed to harmonise well with the rail network or other bus routes. This reduces their usefulness for commuters and impedes patronage growth. For example, data supplied by PTV indicates that around 80 per cent of bus services have an average wait time of 20 minutes or more between services, and around 39 per cent of bus services take more than 10 minutes to connect with key train services.

VAGO's 2013 report *Developing Transport Infrastructure and Services for Population Growth Areas* found that a series of bus service reviews conducted by the former Department of Transport (DOT) between 2007 and 2010 identified similar issues. Figure 2B sets out key deficiencies identified in the reviews and the related consequences.

Figure 2B
Metropolitan bus service reviews, 2007 and 2010

Service deficiencies	Consequence
Hours of service operation are insufficient	Users cannot utilise public transport for activities that start or finish outside operating hours—e.g. accessing late night shopping when bus services finish at 5.30pm.
The days of operation are not sufficient	Users cannot access local buses for trips on some days—e.g. special events on weekends.
Service frequency is poor	Users need to wait a long time between services, which constrains their planning for activities during the day.
Service reliability is poor	Issues such as road congestion cause buses to operate unreliably, resulting in missed connections and users arriving late to their destination.
Connectivity and timetable coordination between modes is not well managed	Users do not feel confident in making transfers, resulting in an under-utilisation of the full public transport network.

Source: Victorian Auditor-General's Office based on metropolitan Melbourne bus service reviews.

Despite these deficiencies, only minor service expansions have been undertaken.

Additionally, market research commissioned in 2011 by PTV found that long wait times between train and bus services, infrequent bus services, unreliable services and insufficient hours of bus service operation are issues impacting on users' desire to make multi-modal trips.

PTV's service and coordination planning acknowledges these issues, which in turn has influenced its related improvement initiatives discussed further in Part 3 of this report.

2.3.1 Role of coordination in statewide strategic transport and land-use planning

The Department of Transport, Planning and Local Infrastructure (DTPLI) has led the development of a new metropolitan planning strategy, *Plan Melbourne*, and is working in partnership with local councils and stakeholders to develop eight regional growth plans. The state's new freight and logistics strategy, *Victoria—The Freight State*, was also released in August 2013. Together, these plans outline the vision for Melbourne's growth to 2050 and set the policy and planning framework for transport bodies.

Plan Melbourne

Like previous statewide strategic plans, *Plan Melbourne* recognises the need for a more connected Melbourne and the importance of an integrated transport system for facilitating access to jobs and services.

Key initiatives identified include simplifying and progressively harmonising the frequency of public transport services to improve connections across modes, upgrading key interchanges to facilitate more seamless transfers and improving traveller amenity.

The Metropolitan Planning Authority was created in October 2013 to drive implementation of the plan, and coordinate efforts across government and agencies.

Plan Melbourne provides time lines and assigns responsibility to agencies for implementing key coordination initiatives. However, it is not clear that these initiatives are supported by a funding strategy. As with past statewide plans, *Plan Melbourne's* key projects and initiatives will be subject to the availability of state funding. Consequently, there is a risk that current plans may not be translated into services.

Regional growth plans

Regional growth plans similarly recognise the need to improve public transport linkages and accessibility to key regional activity hubs. However, none currently provide completion details or set targets that would allow meaningful monitoring and evaluation of how planned actions contribute to the coordination objective of the *Transport Integration Act 2010*.

2.4 Public transport planning to achieve coordination

Network development plans

PTV is responsible for planning the public transport network as part of an integrated transport system, consistent with the strategic policies and plans of DTPLI. PTV's strategic planning processes involve the preparation of network development plans. These include:

- The *Network Development Plan—Metropolitan Rail*, which is PTV's first step in defining the future needs for public transport across metropolitan Melbourne. This plan has established a basis for planning and development of the state's metropolitan railway network to meet future needs, including redesigning train services to maximise opportunities for seamless coordination with buses and trams.
- The *Network Development Plan—On Road Public Transport*, which provides a basis for planning tram and bus routes and for improving connections between modes.
- The *Network Development Plan for regional public transport*, which focuses on connections between regional trains, buses and coaches.

At present, only the December 2012 *Network Development Plan—Metropolitan Rail* is completed.

PTV advised that in developing this plan, consideration was given to protecting and enhancing multi-modal service options and recognising the interrelationships between all public transport modes. This plan seeks to improve coordination by increasing the frequency of services so that the majority of passengers will have access to a 'turn up and go' system at most times of the week.

While this is a positive initiative that provides a sound basis for PTV's future planning for the train network, further work is still required to finalise the *Network Development Plan—On Road Public Transport* and the *Network Development Plan for regional public transport*. This work has been progressing slowly, particularly in relation to the regional public transport plan where only preliminary research has been undertaken. The need to finalise these plans was previously identified in our February 2012 performance audit, *Public Transport Performance*, and in our August 2013 audit, *Developing Transport Infrastructure and Services for Population Growth Areas*.

Completing this work will be vital for further defining and achieving desired coordination outcomes across the network. Until these plans are finalised their implications for future coordination initiatives cannot be assessed. Once completed, these plans are also expected to further inform the development of actions under *Plan Melbourne*. PTV advised that drafts of these plans are expected to be developed by the end of 2014.

Multi-Modal Coordination Policy and Strategy

PTV has also developed a draft Multi-Modal Coordination Policy and Strategy (the policy) that supports the consistent and integrated development of network development plans. The policy covers all Victorian public transport modes, however, the initial phase is targeted towards improving bus–train and tram–train connections in metropolitan Melbourne.

The policy establishes a multi-modal service coordination framework to guide service design elements such as scheduling and network development planning. Key features include:

- an emphasis on prioritising different service levels throughout the network, given that good coordination cannot be practically achieved at all intersecting points and for all directions on the network
- a service coordination hierarchy consisting of feeder services—usually buses—which are scheduled to meet trunk services—usually trains or trams
- defined connection types for all intersecting services—i.e. 'turn up and go', timed and harmonised
- use of standard headways—i.e. the time between services—across the network, set up as multiples of 10 or 20 minutes
- consistent definition of service periods—i.e. peak and off-peak.

The policy aims to:

- achieve connections scheduled no longer than 10 minutes apart on key services
- enhance the reliability of connections
- guarantee connections between the last scheduled bus and train even when trains are running late
- deliver better interchanges that offer short and convenient transfers and good information about connecting services.

This initiative represents a major step forward from the previous mode-by-mode based planning approach.

Importantly, unlike previous plans, it establishes a definition of coordination based on the relative costs and benefits of delivering different levels of coordination. Additionally, by establishing a common approach to service design and development it also has the potential to improve coordination.

The policy has existed as a draft since August 2011 and thus it will be important for PTV to finalise it and extend its scope to regional services in order to support implementation.

2.5 Statewide governance arrangements for coordination initiatives

2.5.1 Oversight of statewide coordination initiatives

DTPLI is responsible for collaborating with transport agencies to ensure policies and plans for an integrated, efficient, coordinated and reliable transport system are developed, aligned and implemented.

DTPLI has established arrangements designed to support effective cross-government implementation of transport system initiatives, including coordination. However, it is not evident that they are effective. DTPLI advised that its primary arrangement for supporting effective cross-government coordination across the portfolio is the Transport Planning Group (TPG). It was formed in June 2012, is chaired by the Deputy Secretary, Transport, and includes representatives from PTV, VicRoads and DTPLI's Transport Group. While the TPG does not have a specific role in coordinating public transport, it does provide high-level oversight of key policy directions as well as a forum for integrating and implementing public transport initiatives.

The TPG does not currently monitor progress against the Act's objectives relating to coordination. DTPLI advised that progress against the objectives of the Act will be monitored through an outcomes framework and set of performance measures that it is currently redeveloping following the release of *Victoria—The Freight State* and *Plan Melbourne*. DTPLI also advised that these measures will be reported in the context of the governance arrangements being established to oversee implementation of *Plan Melbourne*.

The absence of clearly defined agency performance measures, and of systematic reporting from agencies on related initiatives, is likely to compromise DTPLI's capacity to effectively oversee, monitor and coordinate related initiatives across the portfolio.

An explicit focus of the TPG on transport system coordination is warranted, given that this is a legislated objective of the transport system.

2.5.2 Role of Public Transport Victoria in managing the public transport system

The establishment of PTV in late 2011 as the authority responsible for managing Victoria's public transport system is consistent with the approach adopted by other international cities with effective inter-modal coordination.

Specifically, there are indications that this approach has achieved improved public transport network planning in Swiss, German and Swedish cities where planning and scheduling for public transport services is coordinated through a single public agency.

In Australia, in addition to Victoria, these institutional arrangements are also in place in both Perth and Brisbane.

Previous Victorian and Commonwealth Parliamentary inquiries have also noted the existence of a single coordinating public transport authority is good practice. The May 2010 *Select Committee of the Legislative Council on Train Services—First Interim Report* found that ‘responsibility for the delivery of Victoria’s train services is fragmented across a range of government authorities, private operators and independent statutory bodies’.

The report also noted that many of the problems with Melbourne’s public transport system were due to the variance of arrangements from good practice overseas jurisdictions.

Submissions to the Australian Senate Rural and Regional Affairs and Transport References Committee’s 2009 report *Investment of Commonwealth and State funds in public passenger transport infrastructure and services* stressed the need for good governance in public transport services. Having a single regional public transport authority with the power and responsibility to plan and deliver the city’s public transport service, whether or not service provision is contracted out, was identified as a key element of this.

2.5.3 Managing public transport operators

PTV oversees public transport operators who are responsible for the day-to-day operation of services under the existing franchise arrangements with train, tram and bus operators. These agreements, valued at around \$2.7 billion per annum, do not include explicit provisions focused on achieving defined system-wide coordination objectives.

The absence of such provisions means that PTV largely relies on the goodwill of operators and indirect incentives within current franchise agreements to achieve coordination improvements.

PTV advised that the potential for increased patronage, and thus revenue, from improvements in connectivity creates an incentive for operators to support PTV’s coordination initiatives. However, there is little evidence to demonstrate that this approach—including current contractual provisions—adequately supports improved coordination. Specifically, existing contracts mainly establish incentives/penalties for the performance of individual modes and do not explicitly reference defined broader coordination objectives.

Further, there are indications that existing contractual performance standards may undermine and/or impede the achievement of coordination goals. For example, if a bus driver delays a bus to wait for a delayed train, this may adversely impact on the bus operator’s performance result. Additionally, the older metropolitan bus contracts, which comprise 70 per cent of the current bus network, provide very little capacity for the state to encourage better coordination and connectivity as there are no financial penalties for addressing related punctuality and reliability issues.

The implication of these limitations for PTV’s oversight of public transport services and related coordination initiatives is discussed further in Part 4 of this report.

Optimising network planning and scheduling

PTV does not have a software tool that allows public transport networks to be planned in an integrated and optimised way. PTV acknowledges that this has led to increased costs and lost opportunities for improving services.

All aspects of planning a public transport service, such as the development of a timetable and validation of runtimes are undertaken manually, using tools that are not designed for the task. Updating timetables is done using Microsoft Excel, which lacks the ability for PTV to efficiently test different network scenarios. A number of disparate systems exist and processes are therefore duplicated, which increases the amount of labour required to implement a service change.

Recognising these limitations, PTV procured a network planning and scheduling system in May 2014 that it expects will be fully implemented by November 2014. The proposed new system aims to deliver better coordination between services, opportunities for additional coordinated services and improved operational performance.

Recommendations

That Public Transport Victoria:

1. expedites efforts to finalise its Multi-Modal Coordination Policy and Strategy and plans for buses, trams and rural and regional services
2. develops incentives in future bus contracts focused on achieving defined system-wide coordination objectives.

That the Department of Transport, Planning and Local Infrastructure:

3. develops, in consultation with transport agencies, statewide and agency performance measures for transport system coordination to support the planning and monitoring of public transport coordination initiatives
 4. reviews its governance arrangements and establishes mechanisms for systematically monitoring the progress and outcomes of statewide coordination initiatives.
-

3 Addressing the barriers to coordination

At a glance

Background

Frequent, direct and harmonised transport services are vital for establishing an effective and coordinated public transport system. They serve to minimise the time for connecting between different modes and, where feasible, promote a 'turn up and go' mentality where passengers need not look at timetables before they travel.

Conclusion

Public transport services are poorly coordinated. This longstanding deficiency is due to past management approaches that have given insufficient attention to driving coordination. Consequently, many bus services remain indirect and infrequent, with long wait times for connecting train services, and this impedes effective coordination.

Ongoing delay in addressing existing barriers to coordination will impede achievement of transport system objectives.

Findings

- Coordination with trains is impeded due to many bus services having limited hours of operation and being indirect and infrequent, with long wait times for connecting train services.
- Much of the infrastructure, location and design of public transport interchanges is unsuitable for current passenger needs.
- Signage at many stations is not properly designed to convey effective information to travellers to support their timely connection with other services.

Recommendations

That Public Transport Victoria:

- requires the operators of all new bus contracts to undertake a full timetable rebuild to support achievement of defined system-wide coordination targets
- collects and analyses data on the directness of bus routes to assist in service planning
- provides real-time bus service information to public transport users to better support the connectivity of buses with other public transport modes.

3.1 Introduction

The efficiency, reliability and quality of public transport can make a major difference to people's willingness to use it.

A network that is well coordinated and provides for easy connections between modes and services can significantly increase the number of destinations that can be reached within reasonable travel time by users.

Frequent, direct and harmonised transport services are vital to establishing an effective and coordinated transport system. They serve to minimise the time for connecting between different modes and, where feasible, promote a 'turn up and go' mentality where passengers need not look at timetables before they travel.

This Part of the report examines whether planned strategies and initiatives adequately address the main barriers to effective and efficient coordination.

There is currently limited data on trams and regional service connections with other modes of public transport. However, buses play a substantial feeder role with other public transport modes—in particular metropolitan trains. This part of the report, therefore, focuses on metropolitan bus and train connections.

3.2 Conclusion

Public transport services are poorly coordinated. This is due to longstanding deficiencies in past management approaches, which have not given sufficient attention to driving improvements in service performance, including coordination. Consequently, many bus services remain indirect and infrequent, with long wait times for connecting train services.

Public Transport Victoria's (PTV) draft coordination framework is a good basis for public transport planning and action, however, more needs to be done to address longstanding barriers to achieving adequate coordination. Ongoing delays in addressing these barriers will impede achievement of transport system objectives.

3.3 The need for better public transport coordination

Melbourne's geographically dispersed population means that effective coordination of its radial train network with other public transport modes, in particular buses, is essential for enabling the efficient movement of persons, including providing access to services and jobs.

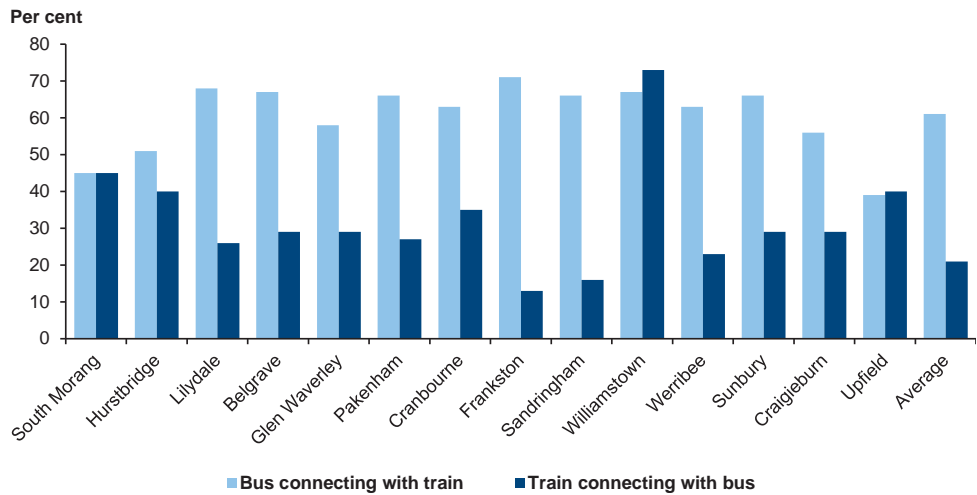
Past deficiencies in statewide planning for public transport coordination have resulted in a number of tram routes that terminate short of the nearest train station, and many bus routes that do not harmonise well with the rail network.

It is important to note that due to varying demand it may be neither feasible nor necessary in all cases to have a connecting bus service for every train arrival.

However, Figure 3A illustrates that, while 61 per cent of buses serving key stations across Melbourne's 14 train lines connect with a train service, only 21 per cent of all train arrivals at these stations connect with a bus.

For some people, particularly those living in growth areas without a car, this can reduce the number of accessible work, education and other opportunities.

Figure 3A
Percentage of scheduled weekday bus and train services that connect, May 2014



Note: Analysis excludes city loop stations. Williamstown train line includes the Footscray station which is a major interchange. Frankston line also includes the Stony Point line. Chart excludes the Alamein line as it does not have any key stations.

Source: Victorian Auditor-General's office based on information supplied by Public Transport Victoria.

Appendix B of this report provides further information about connections of stations along each of the above 14 lines.

3.4 Barriers to effective and efficient coordination

Improving coordination across the wider network remains a significant challenge for PTV given:

- existing levels of disharmonisation of service frequencies across modes
- deficiencies in bus services, including indirect routes, insufficient hours of service operation and low service frequencies resulting in long wait times
- poor interchange design—much of the infrastructure, location and design of interchanges is unsuitable for current passenger needs
- inadequate customer information—signage at many rail and bus stations is not properly designed to convey effective information to travellers to support their timely connection with other services.

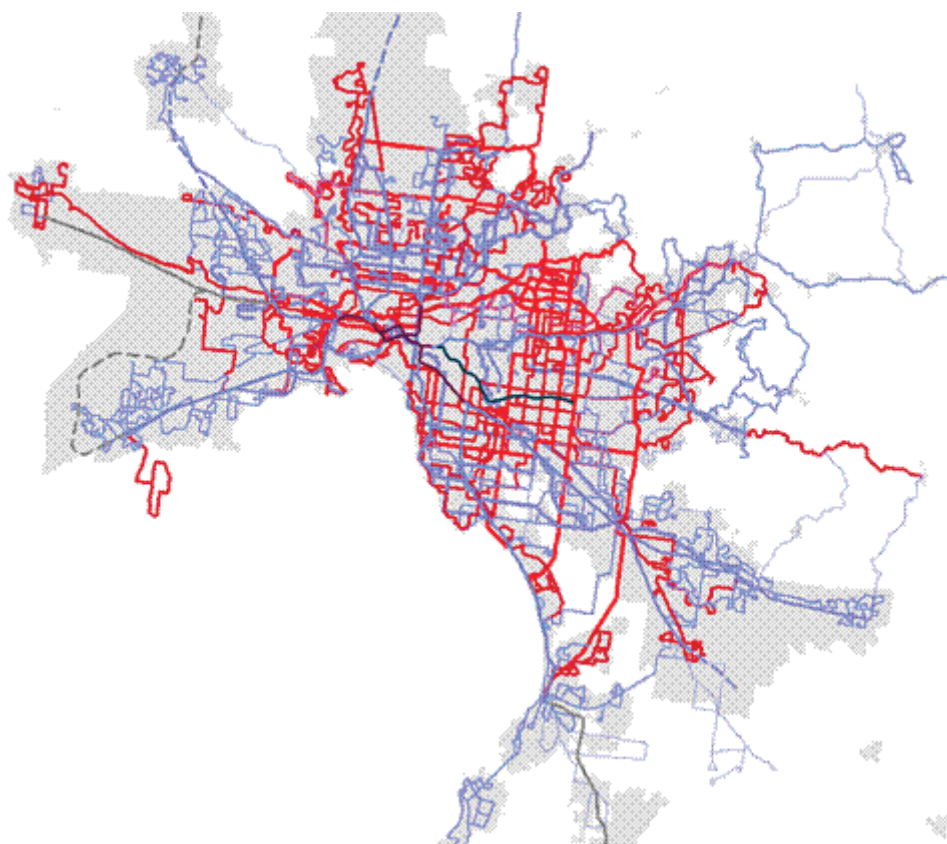
The following section further describes the barriers as they relate to Victoria's public transport network.

3.4.1 Harmonising services

To achieve good coordination between modes, there is a need to ensure services are harmonised. For example, a 10 minute train service is harmonised with a 20 minute bus service because every second bus can be aligned with a train service. In contrast, a 15 minute train service does not coordinate well with a 20 minute bus service as only one of the three bus services per hour can be properly aligned with the train service.

Figure 3B shows the existing level of harmonisation between services across metropolitan Melbourne. Routes coloured blue currently harmonise well with existing or planned service frequencies on the rail network or other bus routes, whereas those coloured red do not.

Figure 3B
Disharmonisation of Melbourne buses and trains, 2011



Source: Victorian Auditor-General's office based on information supplied by Public Transport Victoria.

Figure 3B shows that a significant portion of Melbourne's bus network is not harmonised with train services. Information supplied by PTV indicates this is largely due to the fact that around 45 per cent of Melbourne's bus routes run a weekday timetable that does not harmonise with trains.

This is exacerbated by the wide variation of off-peak and weekend service levels on different parts of Melbourne's train network—which can include a combination of 15, 20, 30 and 40 minute frequencies at different times of the day. This level of variation makes achieving timely connections with all bus services nearly impossible, and causes confusion and uncertainty among public transport users.

These issues were highlighted by a 2011 inter-modal scheduling project commissioned by the former Department of Transport. The review of bus connectivity levels in two metropolitan areas—in the east and south east of Melbourne—noted that the timetables were barely better than if they had been written with no consideration of inter-modal connectivity. Significant issues were identified with the quality of timetables, including unrealistic or inconsistent running times, and inconsistent or disharmonised frequencies. However, the most significant finding was that it would be possible to achieve much better connections and therefore substantial travel time savings with better timetabling without increasing operating costs for operators.



A bus stopping at Regent station in suburban Melbourne.

Timetable updates

In part, the disharmonisation of services is a result of the historically uncoordinated approach to changing timetables, whereby timetables were independently prepared on an individual modal basis with little consideration of wider coordination goals. However, as part of its new approach to coordination, PTV now conducts integrated biannual timetable updates for trains, trams and buses in consultation with all operators.

Since 2012, it has implemented three major timetable changes, and has updated the timetables of more than 200 bus routes across Melbourne based on assessed priorities and conflicts that undermine performance. This has resulted in some positive results in parts of the network, with increased patronage and satisfaction with bus-train connection—as highlighted in the case study in Figure 3C.

Figure 3C
Case study—Service improvement at Williams Landing

The Williams Landing Project involved the construction of a new premium railway station in Williams Landing on the Werribee line, the extension of Palmers Road and five new local bus routes. The project was completed in late April 2013.

Williams Landing passengers now have access to more than 800 train services a week. All Werribee line trains stop there, providing trains every 10 to 12 minutes during peak periods and every 20 minutes during the off-peak.

The project also involved the construction of 550 car parking spaces, a bus terminal, taxi rank and facilities for cyclists.

Five new local bus routes commenced in April 2013, replacing the two less frequent existing routes which operated seven days a week on a 40 minute service, and finished early each evening.

The new routes are more direct and service new areas such as Point Cook South and the new Williams Landing train station. They run twice as frequently and connect to every second train.

As a consequence of these improvements:

- there are at least 500 new train passengers in the AM peak
- more than one-third of train passengers accessed the new station by bus—this is significantly higher than bus access across the rest of the train network, which on average is around 8.5 per cent
- 80.8 per cent of passengers are currently either satisfied or very satisfied with the result of the opening of Williams Landing station
- there are approximately 3 368 average weekday boardings on the Point Cook bus network—this represents an increase of 78.9 per cent from the average number of weekday boardings on the previous bus routes that have been replaced
- on average, there are 1 191 Saturday and 915 Sunday boardings—an increase of 47.6 and 53.5 per cent respectively
- myki data for the five new routes, compared to estimates for the two previous routes, indicated approximately 1 500 new bus passenger trips on a typical weekday
- 62.3 per cent of passengers were either satisfied or very satisfied as a result of the new bus routes at Point Cook—the frequency of services and connectivity with the train were the most commonly cited reasons for satisfaction.



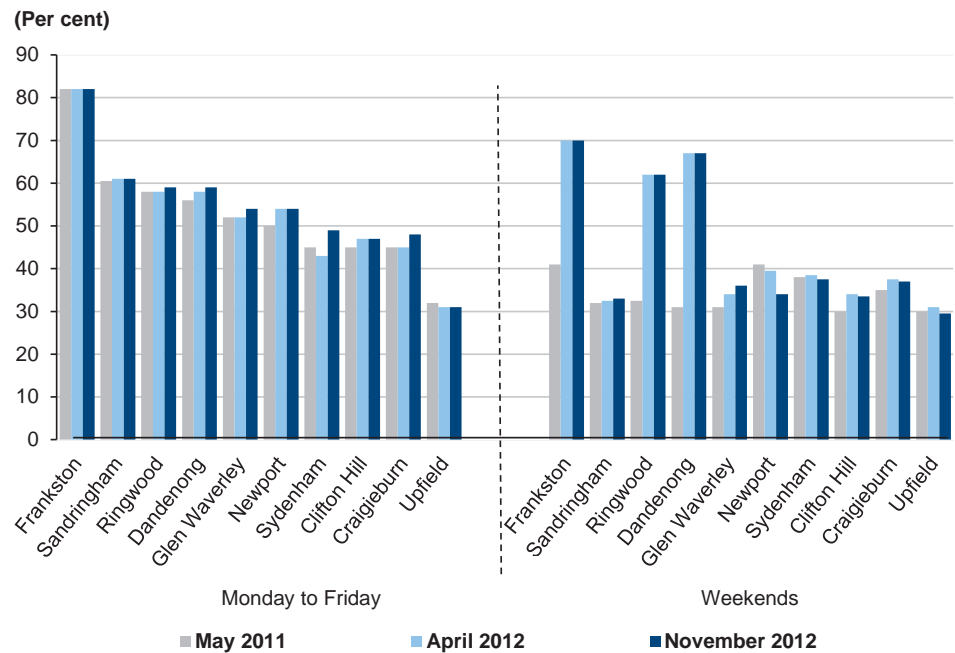
Source: Victorian Auditor-General's Office from *Point Cook and Williams Landing: An evaluation of the impact on passenger usage and perceptions*, August 2013, Public Transport Victoria. Photo courtesy of Public Transport Victoria.

While PTV has achieved some encouraging results in bus–train connections, the major improvements have been in weekend services for Frankston, Ringwood and Dandenong where train frequencies have been increased, as shown in Figure 3D.

Figure 3D shows bus–train coordination for all affected stations after two timetable updates, in April 2012 and November 2012, compared to the timetable in operation as at May 2011, prior to the establishment of PTV.

PTV advised that coordination has remained stable on most lines in 2013 compared to 2012, other than on the Werribee line where improvements have been achieved as a result of the implementation of the Williams Landing station and the connecting bus services.

Figure 3D
Bus–train connection weekday and weekends



Source: Victorian Auditor-General's Office based on information provided by Public Transport Victoria.

Towards the end of this audit, PTV announced timetable changes that took effect from late July 2014. These changes involve 4 000 new train, tram and bus services including:

- more than 200 extra train services per week, with increased frequencies on the Cranbourne and Pakenham lines and more morning peak services for the Frankston line
- around 470 extra tram trips each week, mainly in fast-growing areas of the inner city
- more than 3 260 extra bus trips per week across the state, with extra bus services for the growth areas of Bacchus Marsh and Cranbourne East and more direct routes in Brimbank, Manningham and Port Phillip. Smaller improvements will also occur in selected other metropolitan and regional areas.

Encouragingly, these timetable changes will improve the coordination of some services. However, as they collectively represent a 4 per cent increase in total services across the state, their impact on improving the coordination of all public transport services is therefore likely to be marginal.



A bus stop at Reservoir station with timetable and route information.

Timetable changes to date have been incremental, with most changes focusing on marginal amendments that have not adequately addressed the fundamental underlying issues. While this has led to some improvements, a full rebuild of the timetable, known as a greenfield timetable, needs to be undertaken in some instances where incremental improvements still result in services that are indirect and infrequent. PTV advised that its capacity to effect such change is currently limited by contractual constraints.

The recently signed franchise agreement with Transdev—which comprises around 30 per cent of the metropolitan Melbourne bus network—requires the operator to undertake a greenfields timetable by no later than April 2015. This is positive, and has the potential to improve connectivity for areas serviced by Transdev. This approach would similarly benefit the remaining bus routes. However, PTV is constrained from doing so until the current contracts expire. Contracts for 70 per cent of metropolitan bus services expire in 2015 and in 2017 for both trains and trams.

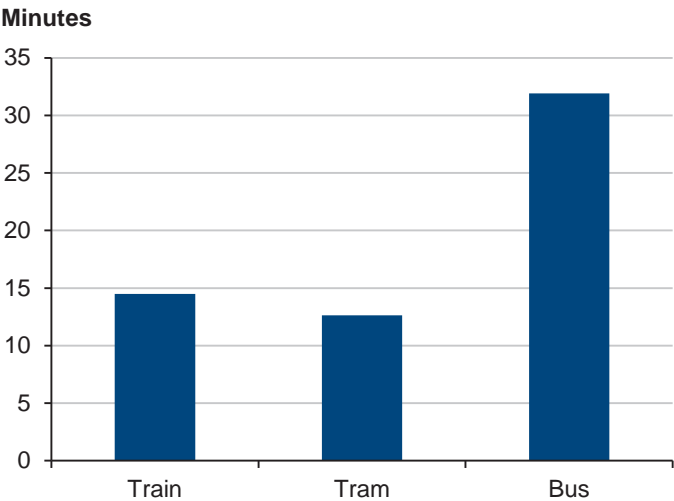
3.4.2 Frequency

Frequent public transport services are vital for providing viable alternatives to car travel. They also serve to minimise the time for connecting between services, and promote a 'turn up and go' mentality where users do not need to look at timetables before they travel.

For example, in Zurich more than half of the tram and bus lines operate on a 'turn up and go' basis, with services running every six minutes, which mean short wait times at most interchanges. During periods where demand is too low to support high frequency services, the network operates on a lower frequency aligned with the change in demand, and timetables are synchronised to minimise waiting times.

As highlighted in Figure 3E, Melbourne trams, and to a lesser extent trains, run relatively frequently—around every 10 to 15 minutes. However, on average, buses do not run at a frequency which makes them a viable alternative to travelling by car.

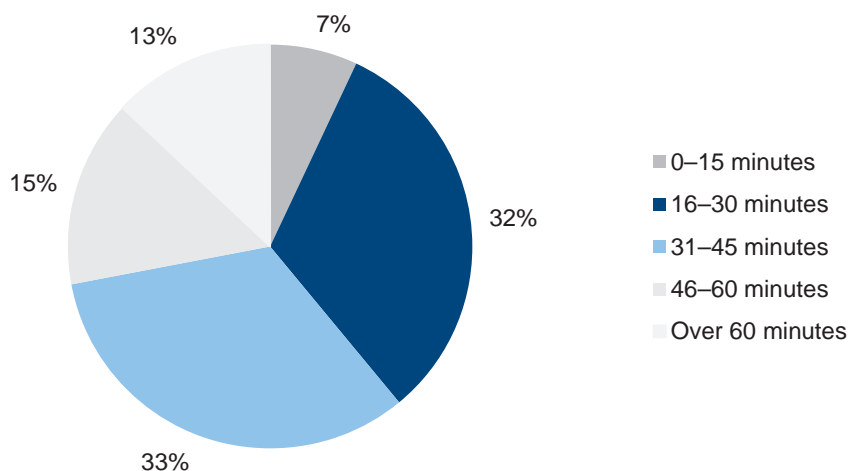
Figure 3E
Average weekday service frequency for metropolitan train, tram and bus services, May 2014



Source: Victoria Auditor-General based on data provided by Public Transport Victoria.

Figure 3F further highlights that 61 per cent of metropolitan bus routes have an average frequency of 31 minutes or more on weekdays.

Figure 3F
Average service frequency of metropolitan bus routes, May 2014



Source: Victoria Auditor General based on data provided by Public Transport Victoria.

3.4.3 Service span

The span of a service is the number of hours and days during which it operates. This will usually vary by route depending on service type, the day of the week, and route demand. Generally, high-demand routes will have longer service spans.

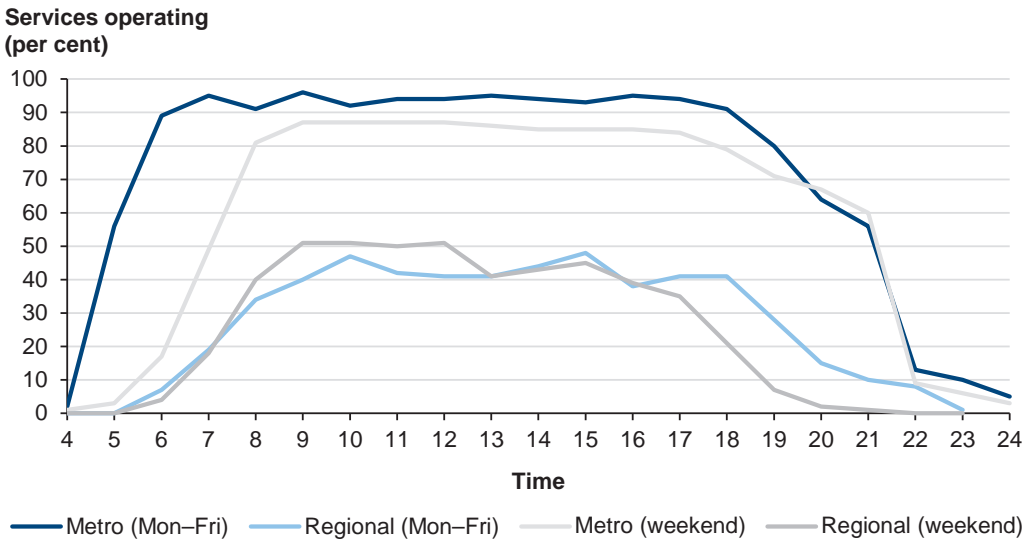
Melbourne's trains and trams both operate for approximately 20 hours per day from Monday to Saturday—5am to 1am—and around 17 hours on Sunday—8am to midnight. In addition, NightRider buses travel between the city and Melbourne's outer suburbs every half hour on Saturday and Sunday mornings.

The hours and days that buses operate vary by route across the network. Figure 3G shows the proportion of metropolitan and regional bus routes by time of day. It also shows that from 7pm, the percentage of bus services declines rapidly.

Further data supplied by PTV indicates that in regional areas no more than 50 per cent of bus routes operate at any given time of the day, reflecting scheduling and demand for these services.

This variable and limited nature of services acts to compromise user confidence and achievement of patronage potential.

Figure 3G
Percentage of bus route operating by time of day, May 2014



Source: Victoria Auditor General based on data provided by Public Transport Victoria.

The fact that many train and tram services continue to operate outside bus hours means that public transport is not available for the full length of a trip for some users. This is a particular issue for outer suburbs, which have a greater reliance on bus services for connecting with the broader public transport network.

3.4.4 Directness

Where they are possible, direct bus routes support the achievement of coordination objectives as they permit more frequent bus services and shorter wait times for connecting public transport services.

While indirect bus routes can maximise geographical coverage of a service, this increases the journey length and time due to frequent stopping and turning. Since travel time is a crucial factor in the attractiveness of public transport, excessively indirect bus routes discourage patronage.

It is important to recognise that there needs to be a trade-off between directness and serving available areas. However, excessively indirect routes and journey times can inhibit patronage growth.

The directness ratio is an indicator used to judge the directness of routes. It is the ratio of the actual length of a service route to the most direct road routing distance between its origin and destination. PTV advised that it does not maintain comprehensive data on the directness of all contracted bus routes.

While directness ratios of around 1.1 to 1.3 are considered desirable, a 2012 study by the Public Transport Users Association found that the average directness ratio for metropolitan buses is 1.7. Figure 3H shows that 20 per cent of services have ratios over 2, and around 10 per cent have ratios above 2.5. By comparison, metropolitan trains and trams have a directness ratio of 1.2.

Figure 3H
Bus route directness by metropolitan local government area, 2012

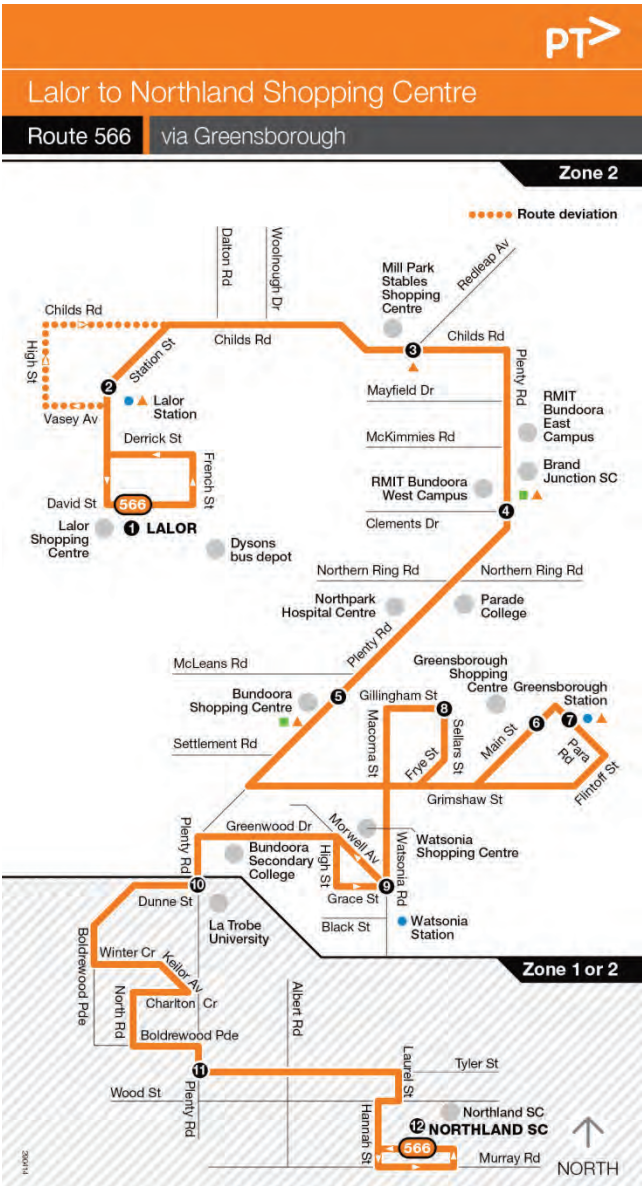
Council	Average directness	Percentage of routes above		
		1.3	2	2.5
Banyule	1.4	36	12	4
Bayside	1.6	56	6	6
Boroondara	1.4	38	8	0
Brimbank	1.5	68	20	0
Cardinia	1.6	55	18	18
Casey	1.9	69	25	19
Dandenong	1.6	62	14	10
Darebin	1.5	46	23	12
Frankston	1.5	58	13	4
Glen Eira	1.4	52	10	0
Hobson Bay	2.0	71	36	14
Hume	1.6	63	19	4
Kingston	1.8	64	16	12
Knox	1.8	62	19	14
Manningham	1.4	39	13	0
Maribyrnong	1.5	38	14	5
Maroondah	1.6	50	25	15
Melbourne	1.2	23	5	3
Melton	1.8	62	23	15
Monash	1.6	54	14	6
Moonee Valley	1.4	38	13	4
Moreland	1.3	33	10	0
Mornington Peninsula	1.5	50	20	0
Nillumbik	1.3	36	9	0
Port Phillip	1.5	47	13	7
Stonnington	1.4	58	11	0
Whitehorse	1.6	53	18	6
Whittlesea	1.6	67	11	11
Wyndham	2.1	83	39	17
Yarra	1.2	19	4	0
Yarra Ranges	1.6	48	28	16
Greater Melbourne	1.7	57	20	10

Source: Victorian Auditor-General's Office from *Driven around the bend—Melbourne's meandering bus routes*, May 2012, Public Transport Users Association.

These indirect routes contribute to lengthier bus journeys and longer travel times. For example, the current Lalor to Northland Shopping Centre via Greensborough route, shown in Figure 3I, has a directness ratio of 2.94, travelling around 27 kilometres to reach a destination only 9.5 kilometres away. This route was identified as indirect in the former Department of Transport's 2008 Whittlesea Bus Service Review following consideration of patronage data and passenger surveys.

As payments to bus operators are based on service kilometres, which are higher for indirect routes, they may have little commercial incentive to propose direct routes.

Figure 3I
Route 566 Lalor to Northland Shopping Centre, May 2014



Source: Public Transport Victoria.

Regional bus services

Regional bus services are the only public transport option for many people in regional areas. However, many have indirect routes. Figure 3J shows the bus route directness for Victoria's three largest regional cities—Ballarat, Bendigo and Geelong—and that almost three quarters of all routes have ratios greater than 1.3.

Figure 3J
Route directness for Victoria's largest regional cities, 2012

City	Average directness	Percentage of routes above		
		1.3	2	2.5
Ballarat	1.8	74	26	11
Bendigo	2.1	73	40	13
Geelong	1.6	76	19	5

Source: Victorian Auditor-General's Office from *Driven around the bend—Melbourne's meandering bus routes*, May 2012, Public Transport Users Association.

3.4.5 Implications for coordination across the public transport network

This analysis highlights significant longstanding gaps in the frequency, availability and directness of Victorian bus services which compromise the state's capacity to achieve effective coordination across the wider network. Until these deficiencies are addressed, further improvements to coordination of public transport will be limited.

DTPLI advised that funding and aligning service delivery to meet the needs of a growing population are key challenges in maintaining and developing transport infrastructure and services.

Given the time it takes to complete a project from inception to completion, resolution of longstanding network needs can take many years to achieve.

The bus network is a good example of a longstanding constraint. DTPLI advised that existing contractual arrangements limit the state's ability to alter routes and frequencies to improve services. In many instances major changes cannot be made until the current contracts for 70 per cent of metropolitan bus services expire in 2015.

Implementing the draft Multi-Modal Coordination Policy and Strategy and associated coordination framework will require significant changes to the existing network—in particular for buses and trains. Current PTV initiatives aimed at improving coordination and providing seamless integration involve a combination of:

- increasing service levels in some areas to reduce wait times
- harmonising services to improve connectivity between bus and trains at key locations
- implementing a four-tier network with standard service levels in each tier
- developing a system of 'interchange hubs' to offer convenient transfers and good information on connecting services
- a more coordinated feeder bus service with minimal and known wait times.

PTV advised that implementing reforms will require addressing barriers, including significant investment of capital and operating expenditure. Major projects to improve capacity, reliability and coordination in the *Network Development Plan—Metropolitan Rail* include the Regional Rail Link, Cranbourne-Pakenham Rail, Metro Rail Capacity Project and new rolling stock. While these projects will likely benefit coordination they are not specifically designed to comprehensively address all barriers.

PTV advised that the majority of outstanding coordination issues would be resolved with the following initiatives:

- introduction of 10 minute off-peak and weekend services on all rail lines, at an estimated annual cost of around \$120 million
- upgrades to train station precincts at the 100 busiest interchanges at an estimated capital cost of \$100 million
- estimated recurrent funding of \$197 million per annum to address bus services deficiencies across metropolitan Melbourne.

While deficiencies with bus services are longstanding, PTV is working on initiatives to improve off-peak and weekend services on all rail lines, and upgrading interchanges, however, these are at an early stage.

Proposed improvements to bus services

PTV's draft Network Development Plan—On Road Public Transport proposes to transform bus services from a complex set of winding routes into a network that is simpler to understand and use. Bus services will be restructured into a hierarchy of three services:

- **Premium services**—will be an expansion of the existing SmartBus network, operating at high frequency over a longer span of hours. The plan indicates that high demand routes on the premium network will be frequent enough to be used without referring to a timetable, providing a 'turn up and go' service in core hours throughout the day. It also proposes operating other premium services at a 'check and go' frequency during core hours of the day.
- **Connector services**—will provide direct access to the premium network and activity centres, as well as providing local travel.
- **Neighbourhood services**—will provide more localised bus services and fill gaps between premium and connector routes.

The draft plan indicates that most residents will live within 800 metres of a connector or premium service.

However, as the Network Development Plan—On Road Public Transport is not yet complete, it is not clear when or over what period this will occur, or how it will be funded.

3.4.6 Interchange design

Interchanges provide access to public transport and are an important determinant of the attractiveness of using public transport. Most interchanges are located at railway stations, although some are at other locations such as shopping centres and university campuses. Many key aspects of coordination come together at interchanges, including information, ticketing, network accessibility, service connectivity and personal security. Therefore, interchange design and location is important to achieving effective coordination. Ideally, passengers should be able to change between modes with a minimum of fuss and be able to wait sheltered from the elements.

Well-coordinated overseas metro systems rely on interchanges to provide comprehensive coverage of the city. For example, the Toronto Transit Commission offers a good example of rail–bus route coordination. Not only do 98 per cent of bus routes connect with one of the Toronto subway lines, many are designed to stop at the top of the escalators servicing train platforms, thereby minimising the walk time between modes. Similar arrangements are also provided at key stations on the new southern suburbs railway in Perth.

These systems have been designed to make changing services as easy as possible, through a combination of station design and operational practices.



A bus interchange at Thomastown station.

A review of metropolitan train station conditions undertaken in 2005 by the former Department of Infrastructure resulted in the upgrading of six train stations and ad hoc improvements to some other stations. However, this is only a small proportion of the 210 stations in the network. The majority of stations have not had improvements for many years, which could inhibit coordination.

PTV is working to turn this situation around and its draft Multi-Modal Coordination Policy and Strategy acknowledges the need to upgrade public transport interchanges. It has undertaken an assessment to identify an 'interchange hub hierarchy' to guide investment priorities, and as a basis for redesigning services to better coordinate with key interchange locations. The *Plan Melbourne* strategy also commits to upgrading interchanges, however, it notes this will be dependent on funding.

An example of improvements to interchanges is shown below. The \$66 million upgrade of the Ringwood train station is expected to deliver a modern integrated facility and provide for seamless transfers between trains and buses.



*Concept design for Ringwood station and interchange upgrade.
Courtesy of Public Transport Victoria.*

Better information

Information is essential to providing customers with confidence in using public transport and increasing their satisfaction, which can lead to patronage and revenue growth.

Melbourne's public transport network is large and complex, and high quality user information is needed to navigate it and to improve its attractiveness to new and existing users. Timetables, bus stop information and vehicle signage can all be used to attract new passengers by highlighting how and when services operate.

User information can be enhanced through the use of maps, signs, information pamphlets and advertising. Even the way routes are numbered and marketed can provide the user with useful information. PTV's vision for bus services to form part of a multi-modal transport network makes the availability of useful maps and information across the network important.

However, the draft Multi-Modal Coordination Policy and Strategy indicates that at many bus–train interchanges there is a complete absence of information about bus routes and service frequencies, with much of the information available limited to basic directional signage—as shown in this photograph.



Bus directional signage. Courtesy of Public Transport Victoria, draft Multi-Modal Coordination Policy and Strategy.

Without adequate information, passengers may not be aware of the existence of connecting services. Similarly, there is a lack of information for bus operators on the running times of trains. For example, at most train stations in Melbourne bus drivers are not provided with any real-time information about how train services are operating, and in some locations bus drivers cannot even see train platforms.

Without real-time information, a bus driver waiting for a connecting train has little idea:

- whether the train is running late and how late it is running
- whether the train is cancelled
- whether the train has already arrived and departed
- if a train they can see arriving is the scheduled connecting service, or an earlier service running late.

This makes it difficult for bus drivers to know what to do if trains do not appear to be running on schedule, and may contribute to instances where users miss connections.

Given that 55 per cent of Melbourne’s regular bus routes serve at least two stations and 32 per cent serve three or more stations, it is not always possible for a bus to wait for a late train because of follow-on delays to subsequent trips by that bus.

By providing bus drivers with real-time information about scheduled trains they will be able to make informed decisions about whether to wait for connecting trains. This would not only improve the likelihood of passengers being able to make connections when there are delays, but would also help buses run on time, by avoiding waits for significantly delayed or cancelled trains.

Frankston and Ringwood stations have real-time systems, but this has not been rolled out to more locations. In Perth and Adelaide, real-time information displays for bus drivers have been standard at train–bus interchanges for many years.



Scheduled Arrival Time	Destination	Platform	Mins to Arrival
16:10	BELGRAVE	51	1
16:10	FLINDERS	51	3
16:18	LILYDALE	51	9

*Real-time train information provided to bus drivers at Ringwood station.
Courtesy of Bus Association Victoria.*

PTV has recognised the need for better information and has recently developed a Customer Information Road Map working group to improve customer information on the public transport network.

The group has undertaken a review of customer information overseas and is currently working on improving:

- bus information by providing clearer route, ticketing and service information at bus stops.
- communication on disruptions to ensure that customers have access to accurate, timely information to enable them to make alternative plans.

In June 2014, PTV also began providing live travel updates on its website. These updates have the potential to better inform users about their journeys and allow them to make alternative travel plans when there is disruption to services.

Recommendations

That Public Transport Victoria:

5. requires the operators of all new bus contracts to undertake a full timetable rebuild to support achievement of defined system-wide coordination targets
6. collects and analyse data on the directness of bus routes to assist in service planning
7. provides real-time bus service information to public transport users to better support the connectivity of buses with other public transport modes.

4 Monitoring and evaluating the performance of coordination initiatives

At a glance

Background

Addressing coordination of public transport extends beyond good planning to effectively monitoring and evaluating the outcomes of strategies and initiatives.

Conclusion

Public Transport Victoria (PTV) does not adequately measure the performance of its public transport coordination initiatives. While it measures scheduled timetable connections between metropolitan bus and train services for key points on the network, it is unable to reliably assess if these are achieved in practice due to the limitations of its tracking systems for trains and most buses.

Findings

- PTV's current indicator of bus–train connectivity is limited and inaccurate. It does not reflect the true level of connectivity across the network.
- PTV's capacity to effectively monitor public transport operators and services is compromised by an over-reliance on self-reporting, minimal quality assurance, and by a lack of reporting on the achievement of defined coordination goals.
- Initiatives to improve bus tracking systems have failed to meet their original objectives and were activated on only 30 per cent of the network despite significant expenditure and escalation of costs.

Recommendations

That PTV:

- develops measures and reports on indicators that reliably convey the level of intended and actual coordination across different public transport modes.
- strengthens its monitoring processes around the measurement of on-time running of trains and buses and coordination outcomes.

That DTPLI's proposed performance monitoring and reporting framework evaluates achievement of defined statewide coordination goals.

4.1 Introduction

Improving the coordination of public transport extends beyond good planning to effectively monitoring the performance of public transport services and evaluating the outcomes of related coordination strategies and initiatives.

This requires clearly defined and measurable objectives for coordination. It also requires clear performance standards and associated measures for monitoring the efficiency and effectiveness of coordination.

The collection of sufficient, appropriate and reliable data about the performance of public transport services from operators is also vital for systematically monitoring the achievement of desired coordination outcomes.

This Part of the report examines arrangements for monitoring, evaluating and reporting public transport coordination outcomes.

4.2 Conclusion

Public Transport Victoria (PTV) does not adequately measure the performance and impact of public transport coordination initiatives. While it measures and internally reports on scheduled timetable connections between metropolitan train and bus services for key points on the network, it is unable to reliably assess if these are achieved in practice due to limitations with the tracking technology used on trains and most buses. These significant limitations also mean that PTV is highly reliant on self-reporting by operators for determining penalties and other incentive payments applicable under the franchise agreements.

This limits PTV's ability to assess the impact of its planning and timetable improvements, and reduces its accountability for achieving public transport coordination outcomes.

Recent initiatives to improve bus tracking system have failed, and were discontinued on 70 per cent of all services by PTV in 2013 without appropriate justification despite significant expenditure and escalation of costs.

4.3 Monitoring and evaluating the performance of public transport coordination initiatives

As noted in Part 2 of this report, the current absence of clearly defined objectives for public transport coordination, and associated agency performance measures—including systematic reporting by agencies on related initiatives—compromises the state's ability to effectively oversee and manage the performance of coordination initiatives across the portfolio.

Both the Department of Transport, Planning and Local Infrastructure (DTPLI) and PTV have recently begun to address this gap. However, substantial further work is required to develop a robust and comprehensive framework.

Part 2.5 of this report outlines current actions by DTPLI to develop an outcome reporting framework to support implementation of *Plan Melbourne*.

The following sections examine PTV's arrangements for monitoring and reporting on the performance of public transport and related coordination initiatives across the network.

In July 2013, PTV started measuring scheduled timetable connections between metropolitan bus and train services for key stations across the network. However, this information is not reported publicly.

Information supplied by PTV indicates that as at December 2013, 61 per cent of scheduled bus–train connections at these stations had a waiting time in line with PTV's draft Multi-Modal Coordination Policy and Strategy target of less than 10 minutes. However, this is significantly lower than PTV's target of 80 per cent of scheduled connections.

While the monitoring of scheduled connections is a positive initiative, there are several limitations with PTV's measure, which means it is likely to under-report poor performance. For instance:

- It is restricted to metropolitan Melbourne and does not consider regional modal connections nor connections with trams.
- It only reflects the performance of a limited number of stations across the network—40 per cent. If all bus–train connections are measured, only 53.6 per cent of scheduled connections have a waiting time of less than 10 minutes.
- It does not reflect the true level of connectivity across the network as it focuses on the number of lower frequency bus services that connect with higher frequency trains, and does not consider the much greater number of train arrivals that have no connecting bus service. For example, our analysis in Part 3 found that only a minority of train arrivals have a waiting connecting bus service.

Further, our analysis of connectivity at a selection of train stations, shown in Figure 4A, illustrates that while these stations have a high proportion of bus services connecting with trains, these connections currently only cover a minority of train arrivals. This means that in most cases there is no waiting connecting bus service for travellers at these stations.

Figure 4A
Scheduled weekday connections, May 2014

Bus route	Bus direction	Train station	Bus connecting with train (per cent)	Train connecting with bus (per cent)
223	Yarraville	Footscray	83.3	34.7
271	Ringwood	Box Hill	88.4	23.2
404	Roxburgh Park	Broadmeadows	87.0	32.4
461	Caroline Springs	Watergardens	91.6	13.9
671	Chirnside Park	Croydon	100.0	18.2
736	Blackburn	Mitcham	93.3	14.4
742	Chadstone	Oakleigh	81.8	31.4
753	Bayswater	Boronia	73.7	35.9
773	Frankston South	Frankston	77.8	9.0
923	St Kilda	Sandringham	92.3	14.9

Source: Victorian Auditor-General based on analysis of Public Transport Victoria data.

Further, the data maintained by PTV does not measure if the scheduled connections, which are largely dependent on the punctuality of buses and trains, are actually achieved.

Our analysis of PTV's punctuality data indicates that this is unlikely to have occurred for some scheduled connections. Specifically, we observed that during 2012–13 around 8 per cent of train and 6 per cent of bus services ran late. This is likely to have resulted in missed connections at some stations.

Monitoring the performance of transport services

Under the *Transport Integration Act 2010* (the Act), PTV is required to prepare a performance report of Victoria's public transport system to ensure that the standard of service provision meets community needs and expectations. Services are monitored against performance thresholds, particularly in relation to service punctuality and reliability. Customer satisfaction surveys are also conducted.

Franchisees receive additional cash payments from the state if, in a given month, their performance is better than the target. They also pay a penalty if they fail to meet the target.

However, these arrangements are currently limited by an over-reliance on self-reporting by operators, inefficient manual systems with minimal quality assurance and a lack of reporting on the achievement of defined coordination goals.

Limitations in the monitoring of rail providers

The metropolitan rail franchise operator collects service delivery data which it provides to PTV. The operator records the time each train starts and ends its journey. However, this data is collected and recorded manually by the franchisee's station staff and is subject to inaccuracies. Field surveys, costing around \$220 000 per annum, are therefore conducted quarterly by PTV to independently record service delivery and running times for a sample of services. If the survey results show a material inaccuracy in the franchisee's data, the operator's incentive payment or penalty is adjusted in proportion with the magnitude of the discrepancy.

We examined these comparisons and found that PTV had detected under-reporting of trains classified as late—defined as more than 4 minutes 59 seconds later than the scheduled arrival time—and adjusted payments to the operator accordingly. For example, during the period 2012–13 PTV found a total of 343 minutes was under-reported, which resulted in a penalty in excess of \$575 000 being applied. A similar penalty of \$528 125 was also imposed by PTV in 2011–12. However, while the survey provides PTV with some assurance, it only records the arrival times of all trains at Flinders Street Station and terminus stations on each line. This may not detect trains that have missed stations along the way where a stop was scheduled. PTV advised that a system upgrade of its train tracking system will allow automated recording of train arrival times and departure times at multiple points along the route from July 2014. PTV expects that this will improve reliability and coverage of performance data.

For regional trains, arrival times are recorded by station signalling staff. A V/Line employee is then responsible for collating this material, solving any discrepancies and providing information to PTV. While there is a degree of internal scrutiny, there is no independent verification of the times by PTV. Consequently it has no assurance the data supplied by the operator is accurate.

Metropolitan tram services have an Automatic Vehicle Monitoring (AVM) system in place for recording arrival times. Monitoring points are located along every tram route and, whenever a tram passes these locations information is sent to a central database. The information is then forwarded by Yarra Trams to PTV for analysis to determine punctuality and reliability. This information is therefore more reliable, and it was also evident that it was being actively monitored by PTV.

However, VAGO's June 2014 report *Using ICT to Improve Traffic Management* noted that the AVM system is obsolete but that PTV has decided to defer its replacement and extend its useful life. While this is expected to meet PTV's performance monitoring needs, there is a risk that any resulting instability may impair the tram franchisees' ability to meet key franchise benchmarks.

Limitations in the monitoring of bus operators

Bus operators in Melbourne are required to keep records of the punctuality and reliability of at least 5 per cent of their timetabled services. These records are then forwarded to PTV each month. There is no evidence of systematic quality assurance by PTV to verify their accuracy. Therefore, PTV in effect relies on bus operators to self-regulate, which means no one really knows whether they run on time—or in some cases if they run at all.

Given this limitation, PTV has largely relied on anecdotal evidence—for example, passenger complaints—or driver reports in order to assess service performance. This means that there is insufficient information to support effective performance management of bus services and makes it very difficult for PTV to identify and address performance issues, and to what extent complaints by passengers are isolated or systemic in nature.

In the absence of any detailed, regular performance reporting, PTV relies on ad hoc reviews of specific routes, but this information is neither timely nor comprehensive enough to permit effective system-wide monitoring.

The absence of robust performance information and heavy reliance on bus operators self-reporting means it is not possible to reliably use financial incentives to improve bus services. Information supplied by PTV shows that while it has some limited monitoring arrangements that provide it with insights into whether bus services run, in most cases these are not sufficient for assessing bus operators' adherence to timetables and their related performance in achieving PTV's coordination goals.

4.3.1 Recent initiatives to improve the monitoring of services

Recognising the limitations with current monitoring arrangements for bus services, the former Department of Transport (DOT) developed a business case in February 2008 to implement a new bus tracking system.

DOT envisaged that the bus tracking system would assist with addressing critical gaps in performance information by providing data on journey times, punctuality and reliability, to better support the management of the updated bus contracts—including development of related performance incentives.

The bus operator contracts were updated in June 2008 to include provisions for an Operational Performance Regime with incentive and penalty payments dependent on the successful implementation of a bus tracking system.

The business case estimated the total capital cost of the new system at \$9.8 million, with an ongoing operational cost of \$3 million per annum and a benefit-cost ratio (BCR) of one.

In 2010 the successful contractor was selected and awarded a contract for \$7 million over five years for supplying, maintaining and supporting the system. The contract was subsequently varied four times—in September 2010, March 2011, October 2011 and August 2012—for a total of \$15.2 million, bringing its total value to \$22.2 million.

These variations mainly provided funds to install the bus tracking system on additional buses, and to cover recurrent maintenance costs not included in the original budget allocation.

While there is sufficient documentation to support these variations, it is not evident that PTV adequately assessed and advised the board and the minister about the impact of these circumstances on the initial BCR of the project.

PTV advised that by 2013 almost all metropolitan buses had been fitted with tracking devices. However, the system was not activated due to the need to install computer equipment in all bus depots and train staff on how to use the system.

In September 2013, after spending \$14.3 million to implement a new system across 95 per cent of the metropolitan bus network, PTV activated it on only 30 per cent of the network and discontinued the remaining rollout. PTV advised that this decision was based on its review of bus tracking systems across Australia and internationally that led to its decision to procure new, more innovative technology which it advised offers better value for money.

PTV released an expression of interest (EOI) to the market in early December 2013 and appointed the successful supplier in March 2014. PTV advised that the technology available and indicative costs provided from the EOI supported its view that there now is better value for money in the marketplace compared to the original contract awarded by DOT in 2010.

PTV did not adequately document the economic assessment and basis for this view. However, information supplied by PTV during this audit indicates that the new system, currently being implemented, is a more cost-effective solution.

PTV advised that it expected the new system to be fully operational across the metropolitan bus network by July 2014 and following this, progressively across regional buses.

It also advised that it expects the reliability of its performance data will improve with the new bus tracking system and imminent train tracking system upgrade, which will allow recording of train arrival times along key points rather than only at the end of each train journey. It also expects that this will enhance its capacity to assess the effectiveness of its coordination efforts.

PTV further advised that it has recently commenced developing systems to measure regional town bus connectivity with regional rail. However, it acknowledges that this is still in the early stages.

These initiatives have the potential to improve performance information. However, PTV needs to develop, measure and report on complementary indicators that reliably convey the level of intended and actual coordination across public transport modes.

Until recently, the longstanding absence of a bus tracking system meant that performance information previously used by PTV has been inadequate to support effective decision-making and to assess or improve the value for money the state achieves in contracting out the operation of bus services.

Comparing benefits and costs of bus services

PTV has undertaken an assessment of the current performance of the metropolitan bus network based on the value classifications in Figure 4B. The analysis indicates that almost one-in-four current bus routes represent poor value for money because they have under 20 passenger boardings per service hour.

It also highlights that a third of bus routes have a range of between 20 and 30 passenger boardings per service hour offering a small level of benefits. However, some of these services are at risk of falling under the threshold of 20 passenger boardings per service hour, and support to either boost patronage or reduce costs is needed to ensure that these services continue to provide good value for money.

PTV's capacity to address this will be limited until it improves its performance reporting, which it expects will occur post-June 2014 when its new bus tracking system comes online. PTV also advised that a key feature of the new system will be a publicly available bus tracking 'app', which it expects will support enhanced information to users, increased patronage, and therefore improve the value for money of bus services.

Figure 4B
Performance thresholds, February 2014

Value classification of bus service	Performance threshold (average boardings per hour)	Current performance of bus services (per cent)
Poor—costs outweigh benefits	0–20	23
Medium—benefits marginally higher than costs	20–30	33
Good—benefits outweigh costs	30–40	23
Very good—benefits significantly exceed costs	40+	21

Note: Average boardings per hour is calculated from passenger boardings across a week.

Source: Victorian Auditor-General's Office based on information from Public Transport Victoria.

Recommendations

8. That Public Transport Victoria:
 - develops measures and reports on indicators that reliably convey the level of intended and actual coordination across different public transport modes
 - strengthens its monitoring processes around the measurement of on-time running of train and buses and coordination outcomes.
 9. That the Department of Transport, Planning and Local Infrastructure ensures its proposed performance monitoring and reporting framework evaluates achievement of defined statewide coordination goals.
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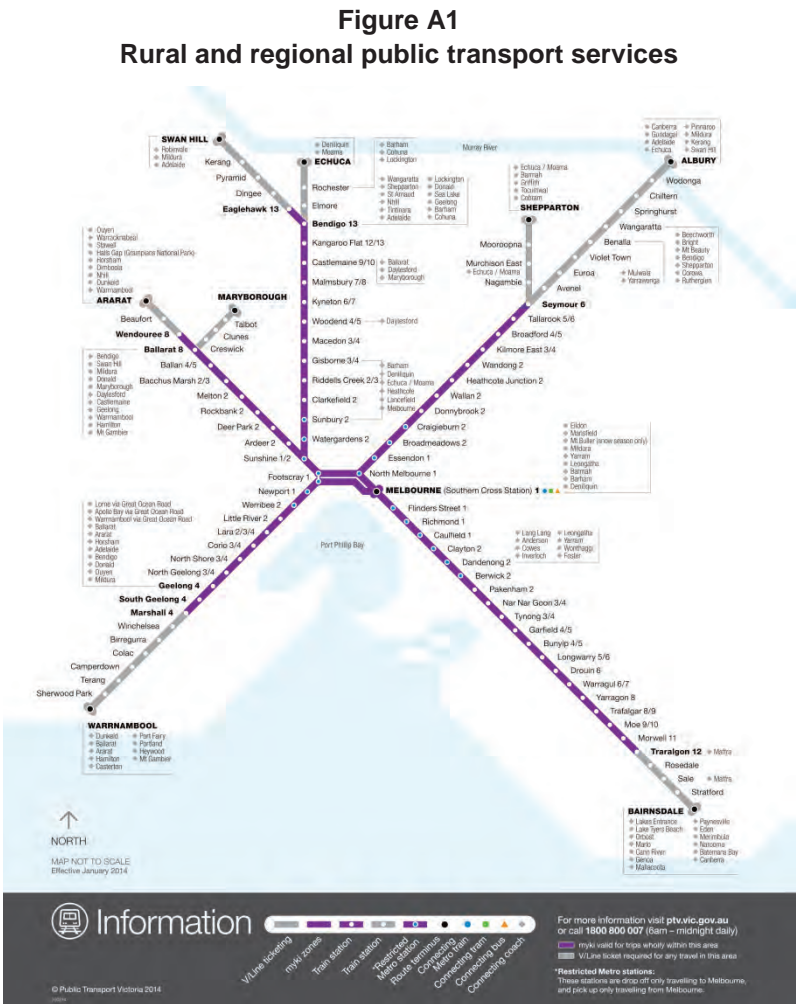
Appendix A.

Maps of Victoria's public transport

Rural and regional public transport services

The rural and regional public transport services comprise a network of core rail and coach services connecting regional centres and metropolitan Melbourne and local buses which operate within towns and cities.

Figure A1 shows the rural and regional core rail and coach services.



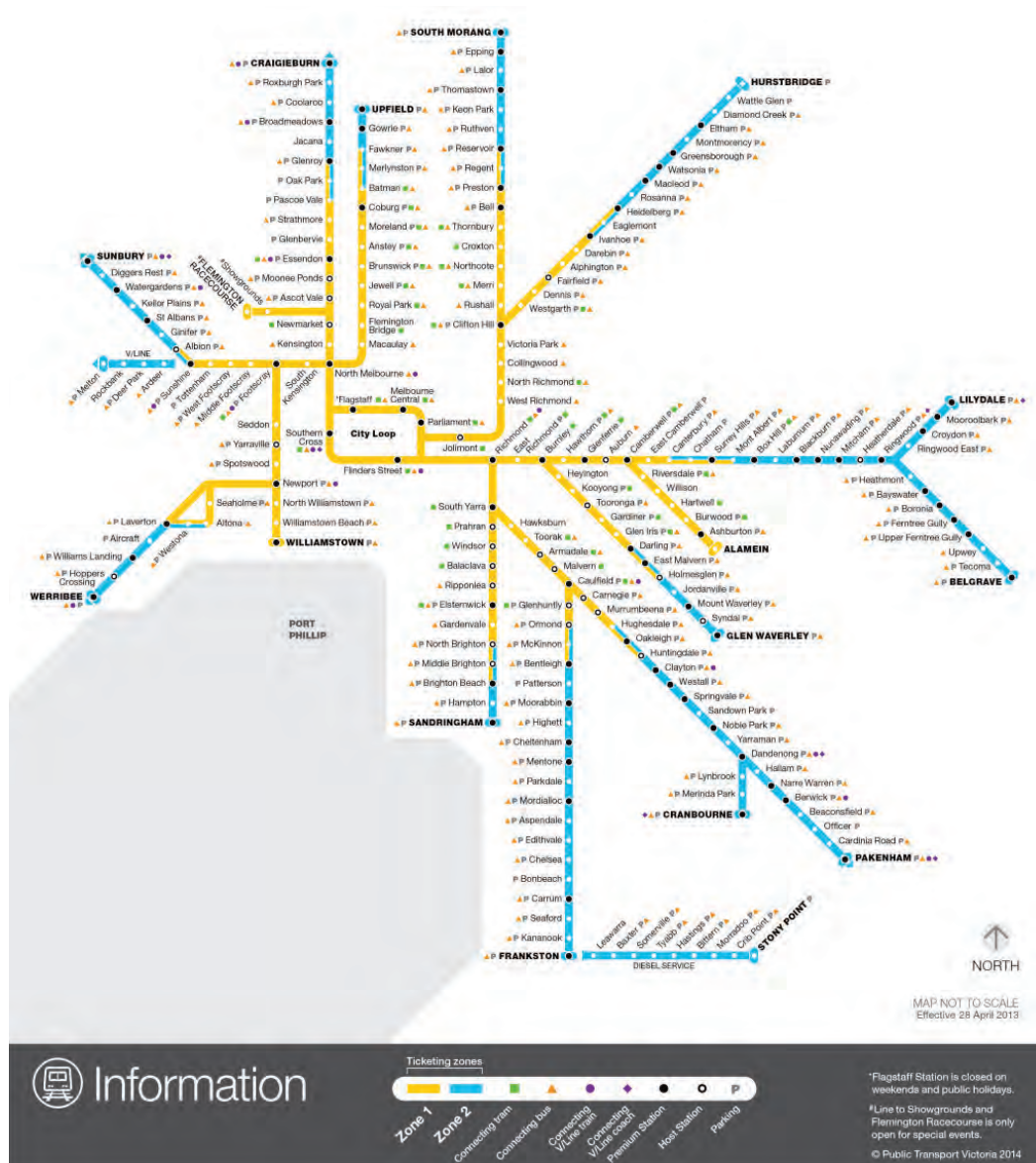
Source: Public Transport Victoria.

Melbourne's public transport network

Public Transport Victoria has not developed a network map showing more than one mode of public transport. Individual maps have been developed for train, tram and SmartBus networks, as shown in Figures A2–A4.

While they are useful for getting around using a particular mode of transport, they provide very little help to anyone contemplating using public transport efficiently for a non-radial trip in Melbourne.

Figure A2
Melbourne's public transport train network



Source: Public Transport Victoria.

Figure A4
Melbourne's SmartBus network



Source: Public Transport Victoria.

As evident from Figures A2–A4, Melbourne's public transport tends to be concentrated in the inner and middle suburbs, where there is a dense network of infrastructure that includes railways, tram lines and bus routes. Beyond the inner suburbs, public transport infrastructure comprises radial train services and feeder and orbital buses.

Appendix B.

Scheduled weekday bus and train service connections

Figure B1 shows the percentage of scheduled weekday bus and train services that connect at key stations.

Figure B1
Percentage of scheduled weekday bus and train services that connect, May 2014

Station	Bus arrivals connecting with trains (per cent)	Train arrivals connecting with buses (per cent)
Alphington	46	33
Altona	22	38
Armadale	59	38
Bayswater	100	4
Beaconsfield	82	30
Belgrave	46	23
Bentleigh	79	15
Berwick	73	17
Blackburn	74	20
Boronia	50	35
Box Hill	74	13
Broadmeadows	59	24
Canterbury	33	26
Carnegie	62	38
Carrum	91	10
Chelsea	53	16
Cheltenham	84	16
Clayton	59	12
Coburg	29	26
Coolaroo	58	67
Craigieburn	39	24
Cranbourne	47	28
Croydon	67	19
Dandenong	69	12

Figure B1
Percentage of scheduled weekday bus and train services that connect,
May 2014 – *continued*

Station	Bus arrivals connecting with trains (per cent)	Train arrivals connecting with buses (per cent)
Elsternwick	49	14
Eltham	43	31
Epping	55	44
Essendon	49	33
Fairfield	38	33
Ferntree Gully	64	67
Footscray	80	39
Frankston	75	9
Ginifer	90	30
Glen Iris	38	35
Glen Waverley	64	22
Glenroy	76	20
Gowrie	38	49
Greensborough	47	41
Hallam	40	32
Heidelberg	57	49
Holmesglen	74	41
Hoppers Crossing	41	21
Huntingdale	67	17
Ivanhoe	63	20
Kananook	62	19
Lalor	45	50
Laverton	77	13
Lilydale	55	26
Lynbrook	38	6
Macleod	72	60
Mentone	76	27
Merinda Park	41	27
Merlynston	33	28
Mitcham	74	10
Moonee Ponds	49	37
Moorabbin	59	19
Mooroolbark	54	16
Mordialloc	77	8
Murrumbeena	45	40
Narre Warren	56	46
Newport	41	19

Figure B1
Percentage of scheduled weekday bus and train services that connect,
May 2014 – *continued*

Station	Bus arrivals connecting with trains (per cent)	Train arrivals connecting with buses (per cent)
Noble Park	82	19
North Brighton	50	7
Nunawading	87	17
Oakleigh	62	19
Pakenham	93	14
Reservoir	36	49
Ringwood	63	15
Rosanna	53	52
Sandringham	79	20
Springvale	69	14
St Albans	59	15
Strathmore	67	23
Sunshine	51	41
Tecoma	50	12
Thomastown	41	35
Upfield	52	43
Upper Ferntree Gully	50	30
Victoria Park	54	26
Watergardens	73	14
Werribee	47	20
Yarraville	37	17

Note: Excludes city loop stations.

Source: Victorian Auditor-General's Office.

Appendix C.

Audit Act 1994 section 16— submissions and comments

Introduction

In accordance with section 16(3) of the *Audit Act 1994*, a copy of this report, or part of this report, was provided to Public Transport Victoria and the Department of Transport, Planning and Local Infrastructure.

The submissions and comments provided are not subject to audit nor the evidentiary standards required to reach an audit conclusion. Responsibility for the accuracy, fairness and balance of those comments rests solely with the agency head.

Responses were received as follows:

Public Transport Victoria	60
Department of Transport, Planning and Local Infrastructure	62

RESPONSE provided by the Chief Executive Officer, Public Transport Victoria



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VAGO file no: 30016
Our ref: DOC/14/141071

Mr John Doyle
Auditor-General
Victorian Auditor-General's Office
Level 24, 35 Collins Street
MELBOURNE VIC 3000



Dear Mr Doyle

Proposed Performance Audit Report Coordinating Public Transport

Thank you for your letter dated 11 July 2014 and the opportunity to provide comment on the proposed audit report on *Coordinating Public Transport*. I would also like to acknowledge the professionalism of the staff from your office who conducted the audit.

As your report acknowledges, notable improvements have been made by Public Transport Victoria (PTV) to the coordination of public transport including the adoption of a network approach to public transport planning, the procurement of a network planning and scheduling system to deliver better public transport coordination and the development of integrated timetable updates for trains, trams and buses.

PTV notes your recommendations to achieve more effective public transport coordination and our responses to your recommendations are outlined below.


No.	VAGO Recommendation – That PTV:	PTV's Response
1.	expedites efforts to finalise its multi-modal coordination policy, strategy and plans for buses, trams and rural and regional services.	PTV is developing a <i>Network Development Plan - On Road Public Transport</i> . Once completed, this plan will comprehensively describe PTV's plan to improve on road public transport coordination through better network design in order to maximise opportunities for seamless coordination.

RESPONSE provided by the Chief Executive Officer, Public Transport Victoria – continued

		The development of the <i>Network Development Plan - On Road Public Transport</i> and PTV's 2013 <i>Network Development Plan - Metropolitan Rail</i> was based on the thinking outlined in the multi-modal coordination policy, which is now embedded in both these plans. Together, these Network Development Plans will play an important role in enhancing public transport coordination.
2.	develops incentives in future bus contracts focused on achieving defined system-wide coordination objectives	In order to facilitate the achievement of system-wide coordination goals, PTV will investigate opportunities develop more robust obligations and incentives in future bus contracts to improve the reliability on the bus network. PTV will make funding submissions to government at appropriate stages to support this.
5.	requires the operators of all new bus contracts to undertake a full timetable rebuild to support achievement of defined system-wide coordination targets.	
6.	collects and analyses data on the directness of bus routes to assist in service planning.	
7.	provides real-time bus service information to public transport users to better support the connectivity of buses with other public transport modes.	PTV's Network Planning division is currently undertaking a comprehensive measurement of the directness of metropolitan bus routes to support ongoing planning and inform the restructure of the metropolitan bus network.
8.	develops measures and reports on indicators that reliably convey the level of intended and actual coordination across different public transport modes strengthens its monitoring processes around the measurement of on-time running of train and buses and coordination outcomes	The Bus Tracking System (BTS) which came into operation in July 2014 will provide accurate real-time tracking data to better support the connectivity of buses with other public transport modes. Public access to this real-time data will enable tracking of buses and further facilitate better coordination outcomes. The BTS, in conjunction with systems being developed to monitor the punctuality of metropolitan trains, will allow PTV to more reliably measure the on-time running of trains and buses. These systems will assist PTV in measuring actual coordination against scheduled coordination between trains and buses and therefore enable better connection times between buses and trains.

Should you require any further information, Brodie Woodland, Director of Governance and Legal (Tel: 03 9027 4705), would be pleased to assist.

Yours sincerely



MARK WILD
Chief Executive Officer
Public Transport Victoria
25/7/14

RESPONSE provided by the Secretary, Department of Transport, Planning and Local Infrastructure.



**Department of Transport,
Planning and Local Infrastructure**

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Mr John Doyle
Auditor-General
Victorian Auditor-General's Office
Level 24, 35 Collins Street
MELBOURNE VIC 3000



Dear Mr Doyle

**PROPOSED PERFORMANCE AUDIT REPORT – COORDINATING PUBLIC
TRANSPORT**

Thank you for your letter of 11 July 2014 providing me with the opportunity to respond to the audit report *Coordinating Public Transport*.

The three recommendations for my department are supported.

As noted in your report, with the release of Plan Melbourne in May 2014 the department is re-developing its framework for monitoring transport system performance. This framework will become part of the broader arrangements to support the implementation of *Plan Melbourne*.

In the redevelopment of this framework the department will develop performance measures and an appropriate mechanism to report on and evaluate transport system coordination.

Yours sincerely

Dean Yates
Secretary

25 / 7 / 14.



Auditor-General's reports

Reports tabled during 2014–15

Report title	Date tabled
Technical and Further Education Institutes: Results of the 2013 Audits (2013–14:1)	August 2014

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